GOOD TEACHING
Data Literacy
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About this Resource

This resource will support teachers and school leaders working individually and collaboratively to use data to make informed decisions about student needs, professional learning needs and teaching and learning programs in order to effect school improvement.

Supporting School Improvement

The use of data is an integral part of the school improvement process.

The National School Improvement Tool (ACER, 2012), endorsed by all Australian governments, identifies nine key domains of practice that are directly related to school improvement including Analysis and Discussion of Data. In an effective school:

A high priority is given to the school-wide analysis and discussion of systematically collected data on student outcomes, including academic, attendance and behavioural outcomes, and student wellbeing. Data analyses consider overall school performance as well as the performances of students from identified priority groups; evidence of improvement/regression over time; performances in comparison with similar schools; and, in the case of data from standardised tests, measures of growth across the years of school. (ACER, 2012, p. 4)

Professional Standards for Teachers and Principals

The Australian Professional Standards for Teachers recognise the importance of using data to identify student learning and support needs and to evaluate teaching practice. Specifically:

Standard 1.5 – Know students and how they learn: Differentiate teaching to meet the specific learning needs of students across the full range of abilities …

Standard 3.6 – Plan for and implement effective teaching and learning: Evaluate and improve teaching programs

Standard 5.4 – Assess, provide feedback and report on student learning: Interpret student data.

(Australian Institute for Teaching and School Leadership, 2016)

The Australian Professional Standards for Principals and the Leadership Profiles recognise the importance of using data to inform school management and improvement.
INTRODUCTION

What is Data?

“What information, especially factors or numbers, collected to be examined and considered and used to help decision-making …”

What is Data Literacy?

According to Earl and Katz (2006, p.45) data literacy is

a thinking process … of:
- standing back and deciding what you need to know and why
- collecting or locating the necessary data
- finding ways to link key data sources
- ensuring that the data are worth considering
- being aware of their limitations
- thinking about what the results mean …
- systematically considering an issue from a range of perspectives so that you really feel that you have evidence to explain, support and also challenge your point of view.

This guide provides school leaders and teachers with information on how to use data for school improvement. Used skilfully, data help teachers to know their students and teach more effectively.

Ideas about data have shifted over time. Historically assessment data were summative: used to identify which students understood what was taught, and to measure student ability and talents which were believed to be fixed, at a point in time.

More recently, data are used formatively, to inform ongoing teaching and learning. Data enables teachers to:
- identify the students’ learning needs and goals which are challenging but achievable through targeted teaching and student effort, learning and persistence
- provide feedback to students on their learning
- group students for teaching according to identified learning needs.

Significantly, data are also used to reflect upon teaching practice to identify effective strategies and professional learning needs.

The Good Teaching Guide – Data Literacy is based on the following framework.

1. A Data Literate School

A data literate school requires a tightly structured systemic approach to the collection and use of data to inform decision making in classrooms and across the school.

2. Understanding Data

Data take many forms and must be fit for the purpose for which they are used.

3. Scrutinising and Analysing Data in Teams

Data must be scrutinised, analysed and questioned by teams of teachers and leaders working collaboratively in a supportive professional learning community.

4. Turning Data into Information

Data can provide evidence to assist understanding and inform decision making.

5. Embedding Data in Teaching and Learning

Ongoing collection and interpretation of data is necessary for targeted teaching and improved learning.

6. Monitoring Student Performance

Data are used for monitoring student learning and effective teaching.
I. A DATA LITERATE SCHOOL

The use of data to inform ongoing school improvement is essential.

Analysis and discussion of data is the second domain of the National School Improvement Tool (ACER, 2012). In an outstanding school in this domain:

The principal and other school leaders clearly articulate their belief that reliable data on student outcomes are crucial to the school’s improvement agenda. The school has established and is implementing a systematic plan for the collection, analysis and use of a range of student achievement and wellbeing data. Test data in areas such as literacy, numeracy and science are key elements of this plan.

Data are used throughout the school to identify gaps in student learning, to monitor improvement over time and to monitor growth across the years of school. A high priority has been given to professional development aimed at building teachers’ and leaders’ data literacy skills. Staff conversations and language reflect a sophisticated understanding of student assessment and data concepts (e.g. value-added; growth; improvement; statistical significance).

Teachers are given test data for their classes electronically and are provided with, and use, software to analyse, display and communicate data on individual and class performances and progress, including comparisons of pre- and post-test results. Teachers routinely use objective data on student achievement as evidence of successful teaching. (ACER, 2012, p. 5)

A data literate school is guided by a broad range of student and community information including:

- demographic data e.g. Australian Early Development Census (AEDC), date of birth, ethnicity, gender, parental background
- achievement data e.g. Australian Curriculum Framework (ACF) ratings, National Assessment Program Literacy and Numeracy (NAPLAN), Progressive Achievement Tests (PAT), Tasmanian Certificate of Education (TCE), other external and school-based assessments
- wellbeing data e.g. support strategies including professional reports and learning plans
- behaviour data e.g. observations, disciplinary sanctions
- participation data e.g. enrolment in schools and courses, attendance, retention
- affective data e.g. results of student, teacher and parent surveys.
**GOOD TEACHING: Data Literacy**

**CASE STUDY: HIGH SCHOOL A**

On assuming the leadership of a highly regarded school, the principal determined to examine the data and identify the school’s strengths and areas for improvement.

The principal assembled a data wall, including summary data from a range of sources including Education Information (edi), DocPoint, and the My School website on areas such as attendance, behaviour, student achievement and community satisfaction. The data revealed very high satisfaction levels from all stakeholders – students, staff and parents – but some domains of NAPLAN in which student achievement, although comparable to similar schools, showed room for improvement.

The first step was for teachers, leaders and parents to understand exactly how the school was performing. Sharing the data was the key.

When the principal first showed the data wall and discussed the data with the school community, some believed that the relatively low performance of some students in areas of literacy was simply a factor of gender. Further evaluation of data confirmed that overall, boys outperform girls in numeracy and vice versa for literacy. However, the leadership and teachers do not believe this is inevitable and now ask the question, ‘What do we need to do to improve student outcomes?’ To address this, the school has appointed a literacy and numeracy coach to support teachers in targeting teaching to the needs of all students and is developing a pedagogical framework for quality teaching with explicit learning intentions, success criteria and feedback to students, as its key features.

Data are now shared with the school community through the School Association, in every staff and parent newsletter and discussed in most staff meetings. Leaders are expected to become familiar with all school data, so a particular focus has been building the data literacy of the leadership team. The principal acknowledges that embedding the use of data to inform school improvement requires a commitment by staff.

To ensure all students receive the support they need to fully participate, teachers monitor student attendance, behaviour and wellbeing issues in systems including edi and Student Support System (SSS). The concept of every student making a year’s growth every year in all areas, is becoming embedded. To monitor this, the school is beginning to collect annual assessments, using PAT.

When asked for advice on how to embed data use across the school, the principal’s response was:

“Select only a few areas to start with, don’t go too fast. Staff need to own the data. Celebrate the positives but create the need for change. The principal needs a deep understanding of the data. We need to understand not only the data but what we can do to improve. Student data also identifies areas for teachers’ PL.”
2. UNDERSTANDING DATA

Forms of data
A wide range of student data is recorded in Department of Education (DoE) systems including: SSS, Student Assessment and Reporting Information System (SARIS) and EduPoint and is also available through edii. Additional data can be gathered from whatever students say, make, write or do. Data can be recorded in various forms such as checklists, spreadsheets, teachers’ record books, audio and video recordings.

Data needs to be fit for purpose:
- What do I want to know about my student(s)?
- Will this data tell me what I need to know?

Data can be considered along two axes:
- informally → formally collected data
- qualitative → quantitative.

Informally – Formally Collected Data
The process for collecting data can be described as informal or formal.

Records of conversations, ad hoc observations, checklists and portfolios of student work are examples of informally collected data.

Data which are formally collected include data from tests and examinations under controlled conditions or using a prescribed process, which may be referenced or standardised by moderation against criteria or capabilities.

Both forms of data are useful for identifying students’ needs and evaluating performance.

Qualitative – Quantitative Data
Qualitative data describe student learning or behaviour. For example, “Student A reads fluently”, “Student B did … outside the canteen.”

Quantitative data measure student learning or behaviour. For example, student absences can be counted, as can the number of inappropriate behaviours outside the canteen, or the number of students in a particular band for NAPLAN writing. Further analysis may involve, for example, calculating means, medians, scale scores, gain, percentiles or relative gain measures in order to summarise the data in meaningful ways.

“Why did this student earn an A?” requires qualitative data. “How many of my students earned an A?” requires quantitative data. Teachers need to use both quantitative and qualitative data to identify and address students’ needs.

Standardised tests, such as NAPLAN, have a vital role to play in assessing student learning. But to target teaching effectively, teachers need to collect a wide range of evidence of each student’s learning. This evidence should come from formal standardised assessments, students’ class work and assignments as well as teachers’ daily conversations with students. No single test provides all the information teachers need.

(Goss & Hunter 2015, p.15)

Qualitative Informal
Verbal report to principal, “Student X threw an apple at the crossing guard.”

Qualitative Formal
Entry in SSS, “Student X threw an apple at the crossing guard.”

Quantitative Informal
Verbal report to parent, “Student X has behaved inappropriately three times this week.”

Quantitative Formal
Observations Summary Report from SSS, shows three observations for inappropriate behaviour by Student X.
Limitations of Data

Reliability
How reliable are the data? How sure are we that the data collection instrument was applied consistently? For example, did all the teachers administering an assessment provide students with the same instructions? Were some students able to use calculators and others not? Were all students given the same amount of time to complete an assessment?

Validity
How valid are the data? How well does the data collection instrument or assessment task measure what we are trying to understand? Does interpretation of this data lead to appropriate conclusions? For example, did a numeracy test accurately measure numeracy, or was student performance limited because they were unable to read the questions?

Is the sample size too small to draw valid conclusions? When looking at data for small cohorts, data for individual students are more valid. The smaller the sample size, the greater the chance that one or two results can skew the data.

Reference points
A reference point is a point of comparison. Student performance can be referenced to:

- the performance of other people in a defined group (norm-referenced)
- predetermined criteria outcomes, or expectation (criteria- or outcomes-referenced)
- progress or performance at a prior time (self-referenced)

(Earl and Katz 2006, p.57)

Triangulation and Data Linkage
Teachers should compare data from a range of sources to measure student performance and identify learning needs.

Triangulation is the cross-verification of data on the same subject matter from two or more sources (e.g., NAPLAN numeracy and PAT Maths).

Data Linkage is the matching of different sets of data for a particular student or school to gain a broader understanding and answer questions such as: “How has this student performed in the past?” “How is non-attendance impacting on student achievement?”

What data are available to teachers?

Data in Department of Education (DoE) systems
Teachers have access to a wide range of data about their students, classes and school from centrally administered systems such as ed, EduPoint, DocPoint, SSS, SARIS, NAPLAN Toolkit, Office of Tasmanian Assessment, Standards and Certification (TASC) (see Appendix Student Information Systems).

Locally collected data
Teachers collect data about students every time they interact with them. These can be combined with centrally provided data to give a broader picture of student learning. Schools can record in-school assessment tasks in spreadsheets provided in DocPoint.

Externally provided data
Some data collected from students is stored by external providers, but accessible to teachers. ACER’s Online Assessment and Reporting System (OARS) for Progressive Achievement Tests (PAT) is a good example. Schools can access PAT data online via OARS. Education Performance and Review (EPR) provides aggregated PAT, NAPLAN and other student data to schools enabling triangulation of literacy and numeracy assessment data.

Data are used for different purposes
Data are used to identify strengths, areas for improvement and monitor growth for individuals, groups of students and across a whole school. Teachers can drill down into school level data to learn more about individual students, or aggregate student level data to gain an understanding of the needs of the whole school.

Student data may also identify areas for professional development for teachers.
### Data Collection

<table>
<thead>
<tr>
<th>Data Collection</th>
<th>Where (Source/data entry system listed first)</th>
<th>Frequency of collection</th>
<th>Responsibility</th>
<th>For which students:</th>
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Senior Secondary School B staff have a shared purpose and responsibility: to support students to succeed in their chosen courses of study. Staff understand that the data are there to help them to help students by targeting their teaching and providing support.

Teachers and leaders at the school:

- Analyse each student’s historical data to identify the most appropriate courses in English and Maths
- Connect datasets for each student to identify students’ needs and monitor their progress
- Evaluate the previous year’s subject and class results to identify areas for improved teaching and professional learning.

Teachers triangulate data from each student’s Transition Profile, NAPLAN results and Year 10 assessment ratings against the Australian Curriculum Framework (ACF) to predict the most appropriate English and Maths courses for the student.

They encourage students to be aspirational but choose a pathway in which they are most likely to succeed.

The school uses an Excel spreadsheet, which can be shared on large screens in team meetings and is accessible to all teachers, to overcome the difficulties of sharing the data of a very large number of students. To existing reports available through edii which provide attendance, NAPLAN and ACF results, they added columns for work habits, internal assessment criteria, interim and progress report ratings for every subject each student is undertaking. They formatted the spreadsheet so that students at risk of not passing a subject – due to poor attendance, work habits or results – are immediately obvious. A team of learning support teachers and leaders monitor this data. Teachers and leaders discuss the progress and work to be completed for all students identified as at risk and work with individual students to develop specific support plans.

The third step in this data-informed practice at the school is to use the aggregated student achievement, attendance and progress data as a measure of the effectiveness of teaching programs. Teachers work in subject teams to analyse this data, refine teaching plans, identify areas for teacher development, and undertake professional learning.
3. SCRUTINISING AND ANALYSING DATA IN TEAMS

For school improvement, data must be scrutinised, analysed and questioned by teams of teachers and leaders working collaboratively in a supportive professional learning community.

Framing questions to guide future actions is a useful way to start:

• Why are there so many observations for inappropriate behaviour outside the canteen?
• What strategies have worked well for teaching this concept?

Protocols for discussing and analysing data

Two protocols which are widely used for discussing and analysing data are Disciplined Dialogue and Here’s What, So What, Now What?

Professional conversations within teams must be:

• focused on the moral purpose of the school
• based on strong evidence.

Disciplined Dialogue

Teams work through prescribed questions:

• What are we seeing in these data?
• Why are we seeing what we are seeing?
• What, if anything, should we be doing about it?

(Wellman and Lipton 2004, p.141)

The key to powerful disciplined dialogue is to resist jumping to conclusions or making inferences, and take the time to work through each stage rigorously.

Here’s What, So What, Now What?

• What are the data telling us? What specific facts should we be examining?
• What have we discovered in our initial analysis of the data? So what does it mean?
• Now what can we do about it? What implications does this have for us and our practice?

(Wellman and Lipton 2004, p.141)
Professional Learning Communities (PLC)

Making sense of data is best done in focused collaborative teams. Working with others gives new insights and enables assumptions to be respectfully challenged.

In a professional learning community, collaboration represents a systematic process in which teachers work together interdependently in order to impact their classroom practice in ways that will lead to better results for their students, for their team and for their school …

Members work together to clarify exactly what each student must learn, monitor each student’s learning on a timely basis, provide systematic interventions that ensure students receive additional time and support for learning when they struggle, and extend and enrich learning when students have already mastered the intended outcomes …

Inherent to a professional learning community are a persistent disquiet with the status quo and a constant search for a better way to achieve goals and accomplish the purpose of the organisation. Systematic processes engage each member of the organisation in an ongoing cycle of the following:

• Gathering evidence of current levels of student learning
• Developing strategies and ideas to build on strengths and address weaknesses in that learning
• Implementing those strategies and ideas
• Analysing the impact of the changes to discover what was effective and what was not
• Applying new knowledge in the next cycle of continuous improvement.

(Dufour et al 2010, pp.11-13)

Professional Learning Teams (PLT)

The concept of Professional Learning Teams (PLT) – teams of teachers working with students of same/similar year levels – was developed by Patrick Griffin and colleagues from the University of Melbourne.

According to Griffin (2014) critical factors for the success of PLTs are:

• the active participation of school leaders
• regularly scheduled meetings – at least fortnightly
• a shift in teacher language from ‘sharing’ to ‘respectful challenge’
• a developmental approach to student learning, focused on what a student is ready to learn, rather than a deficit approach, focused on what a student cannot do
• meticulous documentation of student learning goals and agreed teaching strategies
• the concept of ‘like’ students, identified by teachers as having similar learning needs
• professional learning that is required for teachers to implement the agreed strategies.

Analysing data to improve student learning, 2014 viewed 10/11/2016


Sharing versus Respectful Challenge

One of the barriers to truly effective professional learning communities, where teachers rigorously examine their own practice and that of colleagues, is a desire not to offend others. Respectful challenge focuses on observable evidence – what the student can say, make, write or do. It involves questioning evidence, not an individual. It also involves providing evidence to reinforce statements, rather than resting on assumptions or inferences. (Griffin 2014, p.19)
Action Research Cycles

As teachers and leaders unpack and interpret what is revealed by evidence of student learning (data), the implications for teacher practice, and therefore the professional learning requirements, become evident.

Identifying students’ learning needs through assessment information is unlikely to lead to changes in teaching practice unless teachers have the discipline, curriculum and pedagogical knowledge to make the relevant changes to practice.

(Timperley 2009, p.23).

It is very important that the resulting professional learning supports teachers to better address the identified needs of the students. Teams need to consider:

- the strategies that have proven effective in supporting students
- the strategies that might be more effective in facilitating improvement for this particular student or group of students
- teachers’ understanding and capacity to put identified strategies into practice
- the specific professional learning needs of every teacher and leader.

In an analysis of high performing education systems, Jensen et al (2016, p. 12) states “effective professional learning is the core lever for improving student learning” and must be aligned with, and embedded in school improvement plans.

“The focus of teacher professional development should be determined by the learning needs of students in a classroom. Teachers work collaboratively to develop their instruction to meet their students’ needs and then evaluate the impact on their learning.”

(Learning First, 2016).
The collection and analysis of the data is embedded throughout the improvement process.

The improvement cycle described by Jensen (2016) involves a process of:

1. **Scan and Assess** - collect rich evidence about what’s really happening for learners.
2. **Prioritise** - identify where to focus energy to change the experience and results for learners.
3. **Develop and Plan** - learn more about what students need to learn, powerful teaching and how to recognise and measure success.
4. **Act** - undertake professional learning, collaborate to develop and implement consistent approaches based on the professional learning.
5. **Review** - assess whether new approaches have improved student learning outcomes and why or why not. Share learnings within and between schools. Decide what needs to be done next.

*Figure 1. Improvement cycle (Jensen, 2016)*

This commentary has been produced by the Department of Education based on the work of Ben Jensen.
Leaders at Primary School C believe that working collaboratively in a professional learning community (PLC) is the way to build student achievement.

They recognise that change may be confronting and a PLC cannot be developed piece by piece, but must have all parts in place and be developing in balance. The key elements they identified are:

- full commitment of leadership: participation, enabling structures such as staffing and timetabling, a dedicated space for sharing data and professional learning and support for staff
- processes and protocols for collaborative work
- a blame free culture focused on what the data shows, what students need to learn next and how teachers will make that happen.

The PLC at Primary School C follows the four key actions for every teacher identified in Supporting Literacy and Numeracy Success:

1. Know where students are in their learning
2. Know the literacy and numeracy demands and opportunities of the learning areas
3. Use effective, evidence-based teaching practices and strategies
4. Reflect on teaching practice.

Historical NAPLAN data showed students at the school underperformed in several of the writing criteria, including sentence structure. In term 1, teachers undertook professional learning about teaching writing and the NAPLAN writing rubric. They analysed writing samples from every student, and identified additional fine-grained progression points for students not yet writing in sentences, to ensure teaching was at the point of need for each student. For each score they identified what the students could do and next steps in teaching and learning, framing this as learning intentions for each group. They created a data wall, mapping every student in the school on a continuum from 0 to 6 for sentence structure. Each student’s name card was colour-coded according to their year and home group, enabling teachers to immediately identify students in their class, and answer questions such as:

- Where are the majority of my students?
- Which students need extension?
- Which students need intensive intervention?
- Which students across the school have similar learning needs?

They undertook professional learning and implemented evidence-based teaching strategies over a five-week teaching cycle. At the end of the cycle they assessed new writing samples from each student and repositioned each student’s name on the data wall according to the sophistication of sentences in the latest writing sample. They represented this change in a spreadsheet, colour-coding scores, and by removing names they were able to share the improvement in sentence structure in students’ writing with the school community.

Teachers analysed their own students’ results in terms of the percentage of students who moved backwards, stayed the same and moved forward to plan next actions for students and individual teacher professional learning.
4. TURNING DATA INTO INFORMATION

Summarising data

Summarising (or aggregating) data involves collecting data on multiple measures and/or multiple students and compiling it into a report. Summary data are useful for making comparisons and observing trends which are not evident when individual data sets are viewed. Summary data are therefore very useful for identifying areas for school improvement and for grouping students who have similar needs.

Many reports available through DoE systems provide summary information for the school, class or student. For example, the NAPLAN Results History report enables comparison of students’ performance against previous years’ performance, similar schools, Tasmania, Australia and between domains. This may indicate areas for school improvement and professional learning. The number of students in each band can be identified for purposes such as high level planning for intervention programs.

Figure 2. edi NAPLAN Results History report

<table>
<thead>
<tr>
<th>Percentage of Students in each Band</th>
<th>Summary</th>
<th>Percentage of Students with Relative Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NMS = National Minimum Standard)</td>
<td></td>
<td>(from 2 years prior)</td>
</tr>
<tr>
<td>Exempt</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Band 5 Below NMS</td>
<td>91%</td>
<td>91%</td>
</tr>
<tr>
<td>Band 6 At NMS</td>
<td>92%</td>
<td>94%</td>
</tr>
<tr>
<td>Band 7 Above NMS</td>
<td>95%</td>
<td>85%</td>
</tr>
<tr>
<td>Band 8 Above NMS</td>
<td>-</td>
<td>93%</td>
</tr>
<tr>
<td>Band 9 Above NMS</td>
<td>24%</td>
<td>24%</td>
</tr>
<tr>
<td>Band 10 Above NMS</td>
<td>28%</td>
<td>28%</td>
</tr>
<tr>
<td>Tasmania</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>Australia</td>
<td>16%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Students 2016: 182
Matched Scores 2014-2016: 152

Data are summarised in different ways, for example:

- specific data for a class/year level/school (e.g. edi dashboard attendance dials)
- data for all students in all areas (e.g. Student History Report in edi)
- data in all areas for a particular student (e.g. Student Detailed Report).

Schools can summarise the data they collect. For example, users can generate an Observations Summary Report from SSS to answer questions such as ‘What are the problem behaviours in our school? Where are most of the problems occurring?’

Student assessment results can be recorded in spreadsheets which can be sorted. De-identified summary data are useful for sharing with the school community.
Tagging

For data to become knowledge which is used to target teaching and improve student outcomes, it needs to be connected to students. Summary data are not enough.

On closer inspection, leaders realised that the sheer numbers did not bring to life the actual students that they knew. It was agreed that the system needed to pay closer attention to who the FACES were and where they were – especially the FACES of real kids that the numbers of students below standard represented.

(Sharratt and Fullan 2012, p.15)

Tagging students to data enables teachers and leaders to answer questions such as:

- which students have low attendance?
- are all students making progress?
- which students need extension?

Data are summarised in spreadsheets. Scores are colour coded. Improvement in student achievement is immediately recognisable by the change in colour from the pre-teaching to post-teaching writing task.

Prior to and post teaching, students at Primary School C are tagged to a particular standard on the data wall.

Figure 3. Data Wall Primary School C – tagging and summarising
Drilling Down
Drilling down involves:
- developing a deeper knowledge of each student
- identifying individual student needs
- identifying precisely what the student is ready to learn next.

The Student Detail Report in ed provides summary data for each student including enrolment, attendance and achievement data on a range of assessments, for all of the years they have been enrolled in DoE schools. It is a good starting point for drilling down into individual student’s learning needs.

To develop a detailed knowledge of each student, teachers need to drill down into student attendance, achievement and support data in the reports provided in edi, DocPoint and SSS.

- How has this student progressed over the years of schooling?
- Has this student made continuous progress in all learning areas?
- Do results from standardised tests correspond with ACF ratings?
- What other information do we have that will help us to support this student?

Student Name

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Name</th>
<th>Emergency</th>
<th>PG</th>
<th>MC</th>
<th>Contact Method</th>
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<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>0000 000 000</td>
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</tbody>
</table>

Kindergarten Development Checks

- KDC RP1: At Risk
- KDC RP2: All Achieved

Reading, Writing, Spelling, Grammar & Numeracy Percentiles

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Reading</th>
<th>Writing</th>
<th>Spelling</th>
<th>Grammar</th>
<th>Numeracy</th>
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<tbody>
<tr>
<td>PPS 1st Assessment</td>
<td>47</td>
<td>70</td>
<td>85</td>
<td>74</td>
<td>60</td>
</tr>
<tr>
<td>PPS 2nd Assessment</td>
<td>75</td>
<td>82</td>
<td>87</td>
<td>88</td>
<td>76</td>
</tr>
</tbody>
</table>

Year 3
- Year 5: 52
- Year 7: 99
- Year 9: 93

Year 5
- Year 7: 99
- Year 9: 85

Progressive Achievement Testing (PAT) Percentiles

<table>
<thead>
<tr>
<th>Reading</th>
<th>Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>71 (14/10/2015)</td>
<td>81 (14/10/2015)</td>
</tr>
<tr>
<td>52 (03/09/2014)</td>
<td>64 (09/09/2014)</td>
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Australian Curriculum (ACF) Ratings

<table>
<thead>
<tr>
<th>Year Level</th>
<th>English</th>
<th>Maths</th>
<th>Maths 10A</th>
<th>Science</th>
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</thead>
<tbody>
<tr>
<td>Mid-year 2012</td>
<td>C</td>
<td>C</td>
<td>N/A</td>
<td>C</td>
<td>N/A</td>
</tr>
<tr>
<td>End-year 2012</td>
<td>C</td>
<td>B</td>
<td>N/A</td>
<td>C</td>
<td>N/A</td>
</tr>
<tr>
<td>Mid-year 2013</td>
<td>C</td>
<td>B</td>
<td>N/A</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>End-year 2013</td>
<td>C</td>
<td>B</td>
<td>N/A</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>Mid-year 2014</td>
<td>C</td>
<td>C</td>
<td>N/A</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>End-year 2014</td>
<td>C</td>
<td>B</td>
<td>N/A</td>
<td>C</td>
<td>C</td>
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<tr>
<td>Mid-year 2015</td>
<td>B</td>
<td>B</td>
<td>N/A</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>End-year 2015</td>
<td>B</td>
<td>B</td>
<td>N/A</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Mid-year 2016</td>
<td>C</td>
<td>B</td>
<td>N/A</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>End-year 2016</td>
<td>C</td>
<td>B</td>
<td>N/A</td>
<td>B</td>
<td>B</td>
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Swimming and Water Safety Assessment Results

No data available

Number of Whole Days Absent in the Year

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Number of Suspensions in the Year

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<td>0</td>
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<tr>
<td>Year 2</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

Enrolment History

<table>
<thead>
<tr>
<th>Year</th>
<th>Ed Id</th>
<th>School</th>
<th>Year Level</th>
<th>Roll Class</th>
<th>FTE</th>
<th>Enrolment Status</th>
<th>Enrolment Start Date</th>
<th>Enrolment End Date</th>
</tr>
</thead>
</table>

Figure 4. edi Student Detailed Report
Reports such as the NAPLAN Class Report identify which students need learning support in identified areas. The example below shows that Class 7 would benefit from further instruction in concepts addressed in questions Q21, C26, C16, Q9, and Q25. Future focus for individual students is also identified, e.g. student Ella SampleStudent needs to focus on C18, C24, Q24, Q25 and Q26. This report includes links to the individual questions and related curriculum resources.
School examples of graphic organisers for student data

Data Walls (for summarising, tagging, drilling down)

Data walls create visuals of all students’ progress and provide a forum for rich conversation among teachers. (Sharratt and Fullan 2012, p. 78).

Data walls may be used throughout the process from summary data (e.g. Secondary School A) to individual student data matched to specific learning goals (e.g. Primary School C). At all levels they facilitate the sharing of school and student data to inform decision making and teaching.

Figure 6. Data Wall at Primary School C
Spreadsheets (for summarising, tagging)
Excel spreadsheets which are shared with teachers, may be used as an alternative to data walls (e.g. Senior Secondary School B). Cells can be formatted to make trends more visible by colour coding scores. Data can be easily sorted and filtered and names removed for sharing with the school community. Many DoE reports are available in Excel format.

Pyramids (for summarising, tagging)
Combined School D uses an approach based upon Response to Intervention (Buffum, Mattos and Weber, 2010). Pyramids are used to identify the number or percentage of students requiring particular levels of teacher support. The names of the students in each group are added on the reverse side.

Figure 7. Combined School D – summarising and tagging
Two years ago, Combined School D created a data team. Together, they learned to analyse and interpret data so that they could confidently lead colleagues through the process. The team discovered that data was overwhelming for many teachers. “We knew we needed to do something to simplify it for staff, and personalise it.”

The data team decided to represent the data graphically. They created summaries of NAPLAN data, based on the Pyramid Response to Intervention (Buffum, Mattos, Webber, 2010). The students’ results were divided into five tiers, based on percentile ranking. Students’ names and faces were tagged to the appropriate tier on the reverse of the pyramid.

This was a key step forward. Subsequently, almost all data at Combined School D – NAPLAN, PAT, behaviour, attendance and classroom data – are presented in pyramids. Reading Recovery levels are presented as data walls. Simple visual representations were found to be highly effective in developing teachers’ data literacy.

Since those early steps, there has been a cultural shift and data are used across the school. Data are unpacked at a whole school level and in teaching teams. Teachers are enthusiastic about data, and have an expectation that they will be shared openly. At the start of each year, data are used by teaching teams to set formal ISMART* goals based on cohort literacy, numeracy or attendance data. At the end of the year, teams present their goals and the progress the team has made to achieve them, to their colleagues. Successes are celebrated and teams are given feedback by their colleagues.

Teachers identified that they needed more information in order to make valid judgements. They developed a data collection calendar incorporating external and school-based assessments. Social and behavioural data completes the picture for each student.

Data analysis, teaching and assessment form a continuous loop. Teaching teams use data to develop targeted teaching programs and common assessment tasks. They analyse the students’ work on the assessment task and the data they collect to identify students who need reteaching and which teaching strategies are most effective. This in turn reveals professional learning needs and mentoring opportunities for teachers. Each team’s data are also interrogated by teachers and leaders from different teams, providing opportunities for respectful challenge.

Leaders at the school articulate that the power of the pyramids is in how they are used. “What is important is what you do with it. How do we take this student to the next level? What teaching strategies are successful and how do we know?”

*ISMART goals (Inspiring, Specific, Measurable, Achievable, Realistic, Time-bound)
Clear evidence indicates that for all students to progress, teaching should be driven by data about what each student already knows and specifically targeted on what they need to learn next.

The fundamental point is this: Instruction is powerful only when it is sufficiently precise and focused to build directly on what students already know and to take them to the next level. While a teacher does and must do many things, the most critical is designing and organising instruction so that it is focused. Without focus, instruction is inefficient, and students spend too much time completing activities that are too easy and do not involve new learning, or too little time on tasks that are too difficult and involve too much new learning or relearning.

(Fullan, Hill and Crevola 2006, pp.33–34)

In order to focus or target teaching, teachers first need to know what their students know and don’t know and for this, they need data.

There are four critical questions teachers and leaders need to answer:

• What is it we expect our students to learn?

• How will we know if each student is learning each of the skills, concepts, and dispositions we have deemed essential?

• How will we respond when some of our students do not learn?

• How will we enrich and extend the learning for students who are already proficient?

(Dufour and Fullan 2013 p.15).

Teachers need to become familiar with data about their students as early as possible to gain an understanding of their prior learning, strengths and needs. Leaders should provide time, support and structures to allow this to take place.

Teachers are then able to use the knowledge they have collected about students to:

• identify learning goals for each student

• group students with similar needs

• plan differentiated teaching for each group: those who need support and those who need extension.

Groups must be fluid and dynamic, based on the specific learning needs identified.

Three highly effective evidence-based strategies for improving students’ learning are:

• **Formative assessment:** the frequent use of assessment to identify individual learning levels and needs, with teachers using the results to adapt their teaching in order to meet those needs

• **Feedback:** information about learning that is transmitted between students and teachers, allowing teachers to understand what their students do and do not understand, and target their teaching accordingly

• **Formative evaluation of teaching programs:** the use of student learning data by teachers to understand and analyse the effects of their teaching strategies and the impact they are having in class.


Data gained through formative assessment and feedback can provide teachers with information about students’ understanding, inform future learning needs for students and indicate effective practice.

It is crucial that teachers record and share information which will support future planning for the students and that leaders provide time and structures for this to take place.
Student engagement with the data

Working directly with students, to discuss their data and determine their future learning goals is a powerful strategy. Very young students are able to understand what they have learned and what they need to learn in order to progress. The focus should always be on personal growth and progress, rather than on comparison with others.

**Bump It Up Walls**

One way of engaging students in the use of their own data to identify learning goals is the strategy of Bump It Up Walls. Teachers and students jointly develop work samples which demonstrate various levels of sophistication in relation to the concept being learned. Through formative assessment and feedback, students are able to identify what they need to learn and demonstrate in order to progress. This technique is widely used at Primary School E.


**Using data to inform learning programs, 2014** viewed 10/11/2016


---

**Figure 8.** Bump it Up Wall at Primary School E
At Primary School E, two key principles guide teaching and learning:

1. Teachers share responsibility for the learning of all students in the school and particularly across each year.

2. All teachers participate actively in collaborative planning teams: interrogating data, planning for explicit teaching, designing interventions and moderating assessment tasks.

The school has a strategic assessment schedule which specifies a data collection for each year group. This is reviewed each year.

At the beginning of the year Kindergarten teachers meet with each child and their parents to discuss their aspirations for Kinder and to complete an assessment. Data are used to identify student needs and plan for students from their first days at school. Aggregated data from the assessment enable teachers to identify patterns across their class and the cohort.

Prep students are assessed using PIPS, a letter/sound assessment, a school based number assessment and reading levels, or concepts of print. Most data collection is related to literacy particularly reading, as the school staff believe that this provides the foundation for all other learning. In numeracy, the school uses both PIPS data and its own school based assessment tool.

In the later years, the focus in English and Maths shifts from small group interventions to explicit teaching on areas of weakness identified by NAPLAN and other school-based data. Improve has been a useful tool to develop targeted assessments, and moderation is a key aspect of this work. Working in their collaborative teams, teachers of Years 2 and 4 use the NAPLAN Writing Marking Guide to assess students’ writing. Growth from the previous year is identified, and cohort strengths and learning needs are agreed upon. To map each student’s progress from Year 2 to Year 5, the school records school-based assessments in the PAT spreadsheet provided on DocPoint. The spreadsheet has become one of the most powerful sources of data and has contributed to improved outcomes at Primary School E.

The use of this data underpins all interventions and all team planning. Intensive small group support is provided for students identified by the data as not yet achieving benchmarks. Interventions are provided most intensively in the early years, as the school endeavours to use its resources most effectively.

Professional development in the area of data literacy is a priority. All members of the leadership team include an aspect of data literacy in their Performance and Development Plan, and support teaching teams in analysing data. Time is set aside to explore the data and moderate student work to ensure consistency. Work samples for students rated A or B against the ACF, are re-moderated by teachers of the following year level.

Leaders at Primary School E believe that the key to effective data literacy has been: “To get people collaborating in teams, to be clear on expectations, to think beyond standardised testing, and to continuously ask, ‘How is the data improving outcomes?’”
Monitoring is an ongoing process which ensures that the whole school (students, teachers and leaders) is on a path of continuous improvement.

Teachers and leaders use evidence to evaluate progress towards the outcomes they have identified for individual students and teaching groups. They use evidence to reflect upon their work and the work of the Professional Learning Community.

Monitoring integrates the processes of data collection; data analysis and interpretation; and the evaluation of strategies to inform planning. In Professional Learning Community/Professional Learning Team meetings, time should be set aside to discuss and refine plans in the light of new data. Effective monitoring enables teachers and leaders to answer such questions as:

- In which areas is the student or group or school making progress? What evidence do we have?
- Where does the data suggest we should focus as a school or for these students?
- Do similar data sets lead us to the same conclusion e.g. is a student’s or year level’s PAT data congruent with their NAPLAN data?
- Are students doing better than we might have expected? How do we know?
- Which students need further support or reteaching in order to progress? Do they struggle in other learning areas? Are there other factors affecting their progress? What other information might we need?
- How should we refine our teaching strategies to improve student outcomes?
- How can our Professional Learning Community or Professional Learning Team work more effectively?
Figure 9. Primary School F Venn Diagram – grouping students with similar learning needs

Figure 10. Monitoring students’ reading levels
CASE STUDY: PRIMARY SCHOOL F

On assuming leadership of Primary School F, the principal was unfamiliar with the student cohort and recognised the importance of collecting data to identify students’ needs.

Schoolwide PAT testing was introduced, to highlight strengths and weaknesses across the school and for each student and to identify areas for professional learning. Teachers were surprised by the results and asked the questions: ‘What does this mean for our practice? What form of support should be provided to students? How do we raise the outcomes of all students?’

To improve the quality of teaching the school decided on a strategy of collaboration and coaching. This was achieved by employing additional teachers to work with teams to examine data and implement targeted teaching for all students. Students in each year group are tagged by the year team on a Venn diagram in literacy, numeracy and Australian Curriculum assessments (see figure 9). This enables groups to be identified and progress to be tracked. At the end of each term, teams are given time to review the progress made by students, and to start planning targeted teaching for the next term, having considered what needs to be done next for individual students.

To support transition for students at risk, the school developed a Learner Profile. At the end of each year, teachers meet to discuss the needs of students transitioning between their classes. In consultation with parents and carers, they develop a Learner Profile for each student at risk. The Learner Profile focuses on strengths and needs, and includes details about the differentiation required.

Teachers are provided with significant time to engage with the data. At the start of the school year, rather than participating in formal professional learning, teachers spend a day examining data including edl, SSS, Australian Curriculum assessments, PAT data, previous reports, and any other information about their new students. Prior to this, teachers had always felt they were starting the year on the back foot in getting to know the needs of their students.

Monitoring is a key aspect of using data at Primary School F. The leadership team conduct learning walks through classrooms, discussing students’ learning activities with them, and asking targeted questions, such as:

- What are you learning?
- Why are you learning this?
- How are you going?
- How do you know?

During second term each teacher meets with the principal to discuss evidence of each student’s progress and their future learning goals. This process also informs Performance and Development Plans and professional learning.
edi (Education Information)

https://edi.education.tas.gov.au

edi is a web portal linking summary information drawn from all of these other systems. Many edi reports can be downloaded in a range of formats, including Excel, facilitating deeper analysis and interrogation. Data in edi is refreshed overnight. The class dashboard includes a range of reports specific to that group of students and alerts teachers to a range of issues which require action, e.g. recent absences, behaviour issues, learning plans which need attention.

Student Support System (SSS)

https://studentsupport.education.tas.gov.au

This is a reporting and data entry system designed as an electronic file for all student supports. Information is visible to all teachers in the school in which the student is enrolled. SSS is only accessible on DoE sites due to requirements of the Department of Health and Human Services, which provides some information direct to SSS.

SSS is mandated for recording specific student information, currently:

• Learning plans for students with disability, students under Care and Protection Orders, Aboriginal students
• Letters for unexplained/unauthorised absence, if issued
• Applications for part-time attendance or exemption from enrolment
• Disciplinary sanctions (suspensions, exclusions, expulsions and prohibitions)
• Reports from DoE professional support staff (school psychologists, social workers, speech and language pathologists).

and for tracking students at transition from Years 10 to 11 and 11 to 12.

In addition staff can record:

• Important information which impacts upon student participation and which needs to be immediately clear to all teachers, e.g. triggers for student behaviour, communication needs, family violence or access information for the protection of the student.

• Future learning needs, i.e. any information which will assist transition and specific access, equipment, class placement requirements
• Communication with parents and other providers
• Behaviour observations, both positive or inappropriate
• Observations about student wellbeing, medical needs and first aid treatments
• Observations about student learning and course changes
• Strategies implemented for students such as behaviour/medical action plans, referrals to outside providers.

A range of reports can be generated including a report of behaviour observations by student, location, time of day. This report is very useful for monitoring behaviour across the school and drilling down into the behaviour of individual students.

Student Assessment and Reporting Information System (SARIS)

https://saris.education.tas.gov.au

This is a data entry and reporting system. Teachers enter assessments and comments for all students, for all applicable reporting frameworks and student reports are generated from this system.

EduPoint

https://edupoint.education.tas.gov.au

Student and school administration system including student biographical, medical and welfare information such as court orders, and student permissions such as publication of photographs. Attendance is recorded in EduPoint.

NAPLAN Toolkit

https://naplan.education.tas.gov.au

This system enables teachers to access question level results for students’ previous NAPLAN tests in class/year level groups by class at the time of testing or current class. It includes links to the questions, prompts and to relevant teaching and learning resources for each question. This is a reporting system.
DocPoint

https://docpoint.education.tas.gov.au

DocPoint is automatically accessible to principals. Access can be assigned to other staff via VKey. Documents can be downloaded and saved on the school’s server. DocPoint is a document storage facility in which EPR places reports.

DocPoint includes a range of information including school surveys, NAPLAN and PAT reports. Data provided in Excel workbooks can be manipulated for further analysis at a school and student level. Most reports incorporate explanatory notes to facilitate analysis of student data.

The PAT spreadsheet on DocPoint is prepopulated with fields for entry of school-based assessment information.

Office of Tasmanian Assessments, Standards and Certification (TASC)


Provides a range of information related to senior secondary courses and assessment including direct continuation reports which describe the proportion of Year 10 cohorts that go on to achieve senior secondary outcomes including TCE.
GLOSSARY OF TERMS AND ACRONYMS

**ACF**
Australian Curriculum Framework

**AEDC**
The Australian Early Development Census
AEDC is a nationwide population census which measures how children are developing in their first year of full time schooling (Prep in Tasmania). Data are reported publicly at local community level but schools receive aggregated data for their school which may be shared with the school community at discretion of principal.

**Aggregated Data**
Aggregated data are data on multiple measures and/or individuals which is compiled into summary reports e.g. student annual attendance rate for the school (aggregated individual student attendance data), student detail report (a range of measures for one student).

**AITSL**
Australian Institute for Teaching and School Leadership

**ATAR**
Australian Tertiary Admission Rank

**Data Wall**
Data walls create visuals of all students’ progress and provide a forum for rich conversation among teachers. (Sharratt and Fullan 2012, p. 78)

**DoE**
Department of Education, Tasmania

**Gain score**
Gain is the difference in mean scores between tests for the same group of students, e.g. difference in mean score for the same students from Year 5 NAPLAN Reading to Year 7 NAPLAN Reading. A gain score is a measure of growth.

**Growth**
Measures positive or negative change in student performance.

**ICSEA**
Index of Community Socio-Educational Advantage – used to measure the relative educational advantage/disadvantage of schools based on parental education, parental occupation, geographical location and proportion of indigenous students.

**Improve**
An interactive learning tool supported by the Australian Government Department of Education http://www.improve.edu.au

**Improvement**
See Growth

**KDC**
Kindergarten Development Check

**Like school**
A school with similar demographic attributes (e.g. ICSEA, size, student enrolment) to your school.

**Mean**
The average of a set of scores.

**Median**
The middle score of a set of scores.

**Mode**
The most frequent score of a set of scores.

**My School**
Website maintained by ACARA providing school information, updated annually http://www.myschool.edu.au

**NAPLAN**
National Assessment Program – Literacy and Numeracy

**National minimum standard**
The minimum band for a year level which students are expected to achieve for NAPLAN (e.g. Band 5 for Year 7).

**Norm-referenced**
Assessment data related to the performance of others in a defined group e.g. class, year level.

**PAT**
Progressive Achievement Test

**Percentile**
Measure out of 100 indicating the relative standing, from the bottom, of a student in a population (e.g. class, year level).
PLC
Professional Learning Community

PLT
Professional Learning Team

Relative gain
In NAPLAN testing, students starting with lower scores tend to make greater gains on the NAPLAN scale over time than those starting with higher scores. To take account of this issue student gains are compared to the gains of students with the same starting score.

Each student’s relative gain is determined by comparing their gain to the gains of Tasmanian students who had the same (or similar) NAPLAN score in the NAPLAN test two years earlier. If, compared to the current year scores for this group of ‘similar’ students, the student’s current year NAPLAN score is in the:

- highest 25%, their gain is categorised as ‘High’
- middle 50%, their gain is categorised as ‘Medium’
- lowest 25%, their gain is categorised as ‘Low’

The relative gain percentile provides further precision. For example, students with high gains have a relative gain percentile in the range 75–100. A relative gain percentile of 50 indicates normal gain in comparison to other students starting with the same NAPLAN score from two years previously.

Sample size
Number of data points (e.g. students assessed).

Scale Score
A scale score is:

>a raw score that has been mathematically converted to a number that can be placed on a scale. Scale scores relate to all tests in an assessment series and can be used to measure progress over time.

(Butler 2016, p.46)

ACER report student results in PAT as scale scores.

Similar School
Similar schools are schools with similar parental education profiles and socio-economic status.

Standardised tests
A standardised test is one in which all those taking the test answer the same questions, or questions from the same bank of questions, under the same conditions and are scored in the same way.

Statistical significance
Statistically significant results are those that are interpreted as unlikely to have occurred purely by chance and therefore indicate underlying causes.

TCE
Tasmanian Certificate of Education

Value added
See Growth
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