



## DIAGNOSTIC INTERPRETATIONS OF THE ISA DATA

### For classroom teachers

This document is designed to help teachers in understanding and using the ISA reports on class performance. It explains how the detailed information in the Class reports can be used to diagnose particular patterns of strength or weakness in your students in mathematical literacy, reading or writing. This information can then be used to guide your pedagogical decisions.

### ***How does the ISA data relate to your curriculum?***

The ISA assesses core skills in mathematics, reading and writing that are integral to all curricula. The ISA assesses a student's capacity to:

- apply core mathematical processes to a variety of everyday mathematical problems
- apply core reading processes to a variety of everyday texts
- demonstrate core writing skills through the production of a short narrative and a short exposition.

The mathematics and reading skills assessed by the ISA are derived from the definitions developed by the Programme for International Student Assessment (PISA):

- Mathematical Literacy has four content areas of quantity, space and shape, uncertainty and change and relationships and three process aspects of reproduction, connections and reflection.
- Reading literacy has three process aspects of retrieving information, interpreting texts and reflecting on texts, two text formats of non-continuous and continuous and a variety of text types including narrative, information, argument, description and instruction.

The writing in ISA is assessed in three aspects for each task. The narrative is assessed on content, language and spelling. The exposition is assessed on content, language and structure.

It is quite possible that your school's curriculum does not explicitly describe the reading and mathematical processes defined by PISA. However, these skills will underpin many of your curriculum outcomes or the tasks that the curriculum describes. By explicitly addressing these skills in the ISA assessment, the ISA data can help teachers to identify specific problems that students might have in reading and mathematics. It is quite likely that there is a match between writing skills that the ISA assesses and your school's writing assessment criteria.

A more detailed description of the PISA/ISA definitions of mathematical literacy and reading and the writing criteria are given in the ISA Guide to Reports provided electronically with the school's reports. Further information about reading and mathematical literacy is available on the PISA website [www.pisa.oecd.org](http://www.pisa.oecd.org)

An analysis of the curriculum links between the ISA and International Baccalaureate programs has been conducted. ‘Matching ISA reports to PYP and MYP’ is a guide to the match between the ISA/PISA terminology and the IBO’s Primary Years Programme and Middle Years Programme curricula terms. Email [isa@acer.edu.au](mailto:isa@acer.edu.au) for a copy.

## **Identify your students’ strengths and weaknesses compared to all others in this grade**

### **Using the Class report**

#### **Step 1**

Use the Class report to identify particular strengths and weaknesses in your class compared to the performance of other students in the ISA in this grade. Look at the two rows of the Class report that are immediately above the list of student names. The row called ‘% All Grade X’ shows the percentage of all Grade X students who answered each question correctly. The row below this, ‘% This Class’, shows the percentage of students in your class who answered the item correctly. Scan along these two rows to identify any large differences in the percentage correct for a question.

#### **Reading Class Report**

Question No.		Language	Gender	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Aspect				I	I	I	RE	I	RE	I	RE	I	I	RI	RI	I	RI
Text Format		C	C	C	C	C	C	NC	C	C	NC	NC	NC	C	C		
Text Type		Na	Na	Na	Na	In	In	Ta	In	De	Di	Ta	Ta	De	De		
% All Grade 7		85	65	88	32	86	19	67	67	46	83	69	84	38	33		
% This Class		100	50	89	29	72	24	73	56	28	78	50	94	28	6		
Aldrous	Emily	N	F	1	0	1	1	0	0	1	0	1	1	1	1	0	0
Berezner	Wolfram	N	M	1	1	0	0	1	0	m	0	0	0	1	1	0	0
Chan	Jenny	N	F	1	1	0	m	1	m	m	1	0	1	0	1	0	0
Chung	Daniel	N	M	1	0	1	0	1	0	0	0	0	0	1	0	0	0
Doukas	Charles	N	M	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Dulhunty	Lisa	N	F	1	0	1	1	1	0	0	0	0	0	1	0	0	0
Evans	Sarah	E	F	1	1	1	1	1	0	1	1	1	1	1	1	1	0
Frailon	Eveline	N	F	1	0	1	0	1	1	1	1	1	1	1	1	1	1

Percentage of all ISA students in this grade answering Q14 correctly (33%).

Percentage of students in your class answering Q14 correctly (6%).

In this example, 33% of all ISA students in Grade 7 have answered reading question 14 correctly, but only 6% of students in your class have answered it correctly.

The descriptors (with the Class report) describe the skills that each question assessed.

#### **Descriptors page of Class report**

Question 13	Inter the meaning of a word used in a subject-specific way in a scientific descriptive text.
Question 14	Locate synonymous information in the presence of competing information in a scientific descriptive text.
Question 15	Discriminate between fact and opinion in the presence of plausible competing information in a scientific de
Question 16	Link and combine information across a scientific descriptive text

Question 14 in this test assessed the ability to, ‘locate synonymous information in the presence of competing information in a scientific descriptive text’. This is a skill that the students in your class seem particularly weak in compared with others.

You can also identify areas of strength where the percentage correct is higher for your class than for all ISA students in this grade. In the example above, for question 1,

100% of students in your class answered correctly, compared with only 85% of all other ISA students.

You follow exactly the same process for the mathematical literacy report. The descriptors are also located with this report.

The writing report is slightly different as the average score for each component of the two writing tasks (rather than percentage correct) is shown for all ISA students in this grade, compared with the average score for your class. The same principle of identification of differences between these scores applies. Note that the differences for average score will be much less than the differences for percentage correct.

### Writing Class report

Writing Task		Language Background	Gender	Task A - Narrative				
Criterion				Content Raw Score	Language Raw Score	Spelling Raw Score	Total Raw Score	Total Scale Score
Maximum Raw Score				11	11	10	32	N/A
All Grade 5 Average				5.8	5.6	5.7	17.1	474
This Class Average		5.8	5.6	5.7	17.0	475		
Banks	James	E	M	7	6	6	19	524
Derry	Pravin	E	M	5	5	6	16	451
Dulter	Linda	E	F	5	5	6	16	451
Filler	Jason	E	M	5	5	4	14	397

In this example, the average score for this class for narrative writing is 5.8 for content, 5.6 for language and 5.7 for spelling which is identical to the average score for each criterion for all the Grade 5 ISA students. Looking at the individual scores shows the strengths and weakness of particular students in your class in relation to each of the criterion. This example shows that James had a higher-than-average score for narrative Content of 7, whereas Pravin, Linda and Jason had scores of 5. The Language scores were similar for all four students, but Jason had a low Spelling score of 4 compared with 6 for the other three students. The writing descriptors that correspond to the writing scores for each of the criterion are also shown with the report.

### Writing content descriptors

4	Develop a story that includes key elements such as a logical sequence of events, main character/s, and a setting.
5	Show an understanding of narrative writing, with most ideas contributing to the story and an emerging ability to develop characters.
6	Shape writing with a clear beginning and end, with ideas, details and events chosen to enhance the story. Create distinct characters.
7	Link ideas and events within a well-constructed story. Create individualized characters. Deliberately engage the audience.

This example shows the narrative writing content descriptors for levels 4 to 6. James demonstrated the writing skills described in level 7 of the writing descriptors for content. Pravin, Linda and Jason demonstrated skills described in level 5.

## Look for areas of strength and weakness across your class

### Step 2 : Using the static Class report

Look for patterns that will help you to decide what skills you may need to teach to improve areas of weakness.

#### Reading Class report

Question No.																			
Aspect	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Text Format	I	I	I	RE	I	RE	I	RE	I	I	RI	RI	I	RI	RE	I	I	I	RI
Text Type	C	C	C	C	C	C	NC	C	C	NC	NC	NC	C	C	C	C	C	C	C
% All Grade 7	85	65	88	32	86	19	67	67	46	83	69	84	38	33	71	44	7	41	41
% This Class	100	50	89	29	72	24	73	56	28	78	50	94	28	6	65	44	0	29	33

This is a reading example. You have already identified question 14 as being problematic for your class. The next thing to do is look at the text type for this question. Questions 13, 14, 15 and 16 were all based on a scientific descriptive text (shown as DE in text type row). Your class has a lower percentage correct for three of these four questions, suggesting that your students may be unfamiliar with this text type.

Next, look at all the descriptors to see if there are other items addressing similar skills to question 14. Question 19 requires students to, ‘recognise a straightforward paraphrase of a fact stated in a newspaper article’. Your students did not do so well on this question either: 33% of your class answered correctly compared with 41% of all other ISA students in this grade. This suggests that your class may need more practice locating synonymous information and paraphrases of texts.

You can also look for patterns in areas of strength to identify what you are teaching well.

It is easier to use the Excel spreadsheet version of the Class report to look for other patterns in reading and mathematical literacy.

### Step 3: Using the Excel Class report

Use the Excel version of your class report to sort your students by mathematical literacy content area or by competency to identify whether there is a particular area of strength or weakness in your class.

#### Mathematical Literacy Excel Class report spreadsheet

Question No.	1	4	5	7	8	9	10	18	21	22	23	26	27
Competency	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co	Co
Content	Q	S	S	Q	Q	C	C	C	C	C	C	S	S
% All Grade 5	41	79	88	82	74	65	51	78	59	44	44	69	32
% This Class	19	81	90	67	67	67	48	67	62	48	29	57	29

In this example, the columns for the competencies of Reproduction and Reflection have been hidden in the Excel Class report spreadsheet, so only the Connections (Co) competency columns can be seen. Your class percentage correct is much lower than

for all Grade 5 ISA students for questions 1 and 23. You would need to look at the descriptors for these items as these seem to be skills your class lacks.

### Mathematical Literacy Descriptors Grade 5

Question	Descriptor
Question 1	Solve a problem involving addition and rule interpretation in the context of a game.

This shows the descriptor for question 1. Your class had a much lower percentage correct than other ISA students. You would need to first look at the other descriptors that include addition and see if addition is a problem for your class. It is also possible that your students found it hard to interpret the rule for question 1, rather than having difficulty with addition.

The other question where your class had a particularly low percentage correct compared to others is question 23.

### Mathematical Literacy Descriptors Grade 5

Question 21	Continue a seating pattern to work out a total.
Question 22	Work out the number of empty seats in a seating pattern when the number of people is known.
Question 23	Work out the seating pattern required for a given number of people.

When you look at the descriptors you can see that questions 21, 22 and 23 all address a similar problem from different perspectives. Your students had a slightly higher percentage correct (3-4%) for questions 21 and 22, but a much lower percentage correct for question 23 (15%), suggesting that maybe your class is not used to approaching problems like this from this angle.

Your class percentage correct is more than 10% lower for questions 7, 18, and 26 suggesting these are also areas to focus your teaching. Your class has a similar or higher percentage correct for the other questions, but these differences are small.

If you are looking at the reading report, sort your students by text format, text type or by aspect.

### Reading Excel Class report spreadsheet

	Question No.	3	8	11	17	18	19	26	27
	Aspect	RE	RE	RE	RE	RE	RE	RE	RE
	Text Format	C	NC	NC	C	C	C	C	NC
	Text Type	Ag	Ta	Ta	De	De	De	In	Di
	% All Grade 5	47	38	25	23	53	58	83	66
	% This Class	41	23	5	9	50	64	82	73

In this example, the reading aspect columns for Retrieving Information and Interpreting have been hidden, so only the Reflecting (RE) columns can be seen. The percentage correct is much lower for your class than all other Grade 5 ISA students for questions 8 (15%), 11 (20%) and 17 (14%). The percentage correct is similar to or slightly higher than all other Grade 5 ISA students for the other Reflecting questions. This suggests that your students' skills in reflecting are unevenly developed. You need to look at the descriptors for questions 8, 11 and 17 see what kinds of reflecting skills your students may need help to improve.

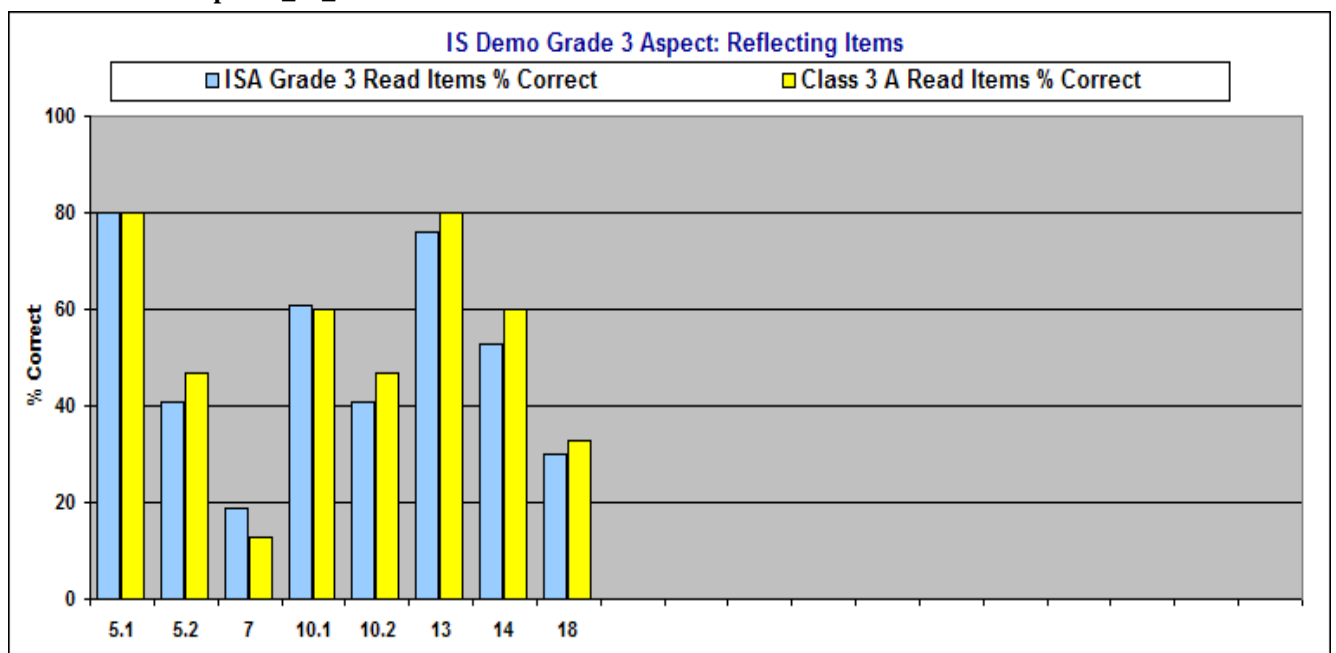
If you are looking at the writing report, you need to look at the given criteria for each task. This was explained in step 1.

## Using the Interactive report

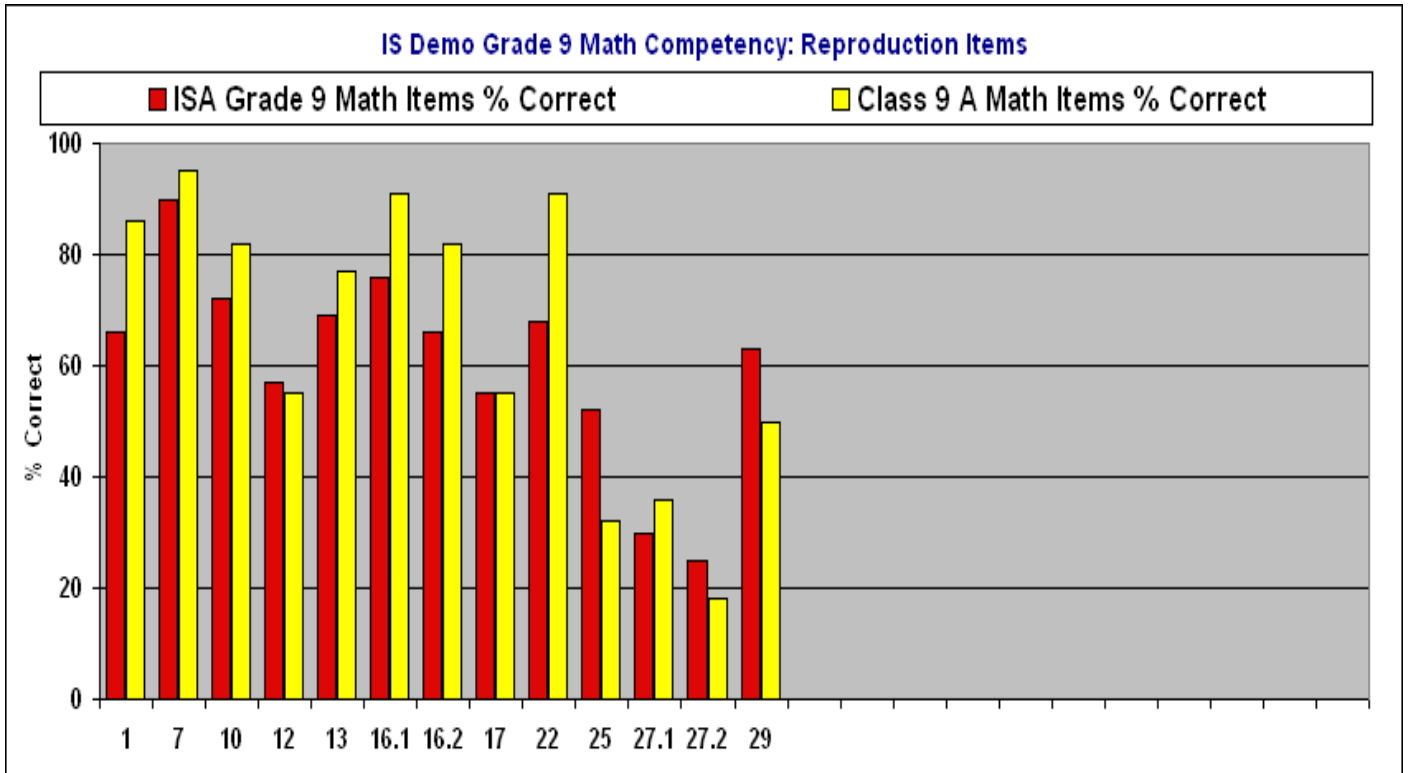
An alternative to sorting student data yourself with the Excel Class spreadsheet is to use the Interactive report. The Interactive report provides a quick and easy way to display your class scores item by item in comparison with all others in ISA at this grade for mathematical literacy and reading. The principles of what to look for in patterns and trends, which were explained in the previous section, apply to the interpretation of the Interactive report. The Interactive report automatically groups and sorts items and displays the relevant descriptors making it easier for you to see patterns.

There are separate sheets of the Interactive report to show detailed diagnostic information by grade level and class for reading and mathematics. For example, the 3\_CI\_math sheet shows Grade 3 mathematics scores by class and the 7\_CI\_Read sheet shows Grade 7 Reading scores by class. These sheets of the Interactive report allow you to sort by mathematical content area or competency and by reading aspect or text type. Use the pull down menus to select what you wish to view and the graphic display will show the performance of your class compared with all other ISA students in this grade for this test and the questions you have selected.

### Interactive report 3\_CI\_Read



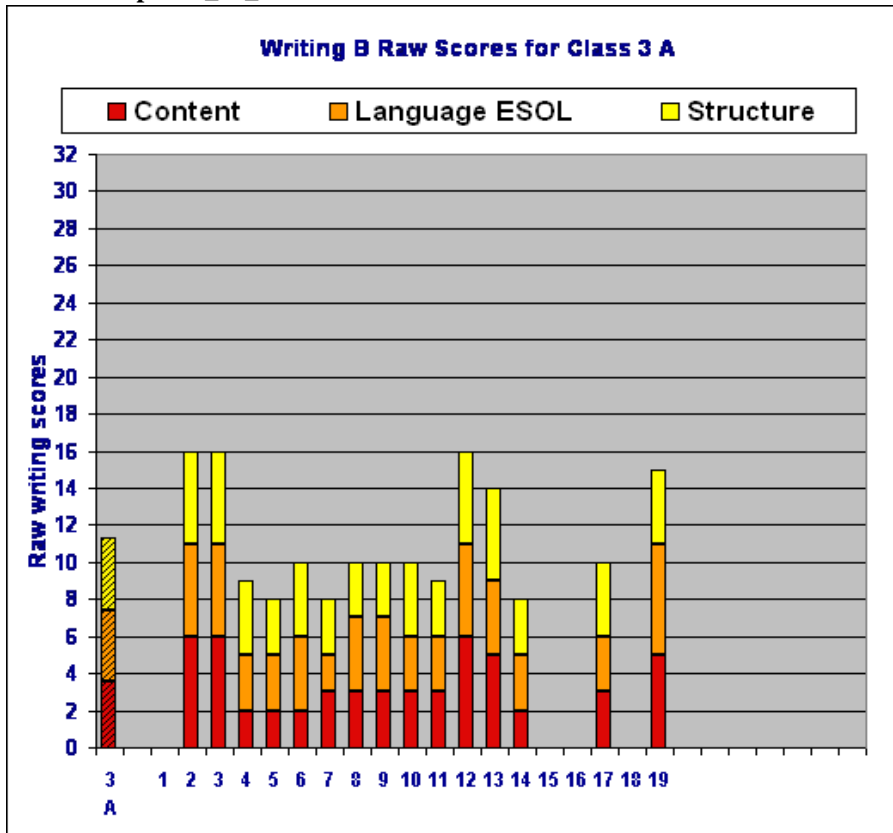
This is an example of a Grade 3 reading class showing all the questions addressing Reflecting, from the interactive report. The blue column shows the percentage correct for all ISA Grade 3 students and the yellow column shows the percentage correct for your class. In this example, your class has a similar or slightly higher percentage correct for every question except question 7. A pull down menu on the same page allows you to view the descriptors for each of the items in the graphic display.



This is an example of a Grade 9 mathematical literacy class. All the questions addressing the mathematical competency of Reproduction have been selected. The red column shows the percentage correct for all ISA Grade 9 students and the yellow column shows the percentage correct for your class. In this example, your class has a higher percentage correct than all other ISA students in Grade 9 for all Reproduction questions, except questions 12, 25, & 27.2 and 29. The difference in performance on question 12 is insignificant. Question 27 is a ‘partial credit’ item with two score points available. More of your students than the ISA mean scored one point, but fewer scored two points. You would need to look at the descriptors for this question and for questions 25 and 29 to identify the particular weaknesses your students seem to have in Reproduction compared with their strength in the other Reproduction questions. You can use the Interactive report pull-down menu to view the descriptor for each of the questions on display.

The writing data in the Interactive report is displayed differently. It shows the proportion of the total score derived from each of the three writing criteria for the each writing task for each student.

**Interactive report 3\_CI\_Write**



This example shows the Writing B or expository scores for Class 3A. The content scores are shown in the red section of each column, the middle orange section shows the Language ESOL score and the top yellow section the structure score. A list on the same page shows the match between each number and a student. This example shows that students 4, 5, 6 and 14 have the lowest content scores in your class and students 2, 3, and 12 the highest content scores.

**Interpreting the data**

Check the patterns for your class.

Is it what you expected?

Are there particular content areas for mathematical literacy that you might need to spend some more time teaching?

Are there some mathematical competencies your class might need to improve?

Do your students seem to find some text types more difficult to read than other students in this grade?

Are there some aspects of reading where your students seem to have particular weaknesses?

Is there a pattern in the performance on one or other of the writing tasks?

## Look for patterns in the individual responses

### Using the Class report

Identify patterns of strength or weakness in individual students. Each student's score for each question is shown on the Class report. A score of 1 means the question was answered correctly, a score of 0 means an incorrect answer, the letter 'm' means the student did not attempt this question and the letter 'a' means the student was absent.

Question No.		Language	Gender	1	2	3	4	5	6	7	8
Aspect				I	I	I	RE	I	RE	I	RE
Text Format				C	C	C	C	C	C	NC	C
Text Type				Na	Na	Na	Na	In	In	Ta	In
% All Grade 7				85	65	88	32	86	19	67	67
% This Class				100	50	89	29	72	24	73	56
Aldrous	Emily	N	F	1	0	1	1	0	0	1	0
Berezner	Wolfram	N	M	1	1	0	0	1	0	m	0
Chan	Jenny	N	F	1	1	0	m	1	m	m	1
Chung	Daniel	N	M	1	0	1	0	1	0	0	0
Doukas	Charles	N	M	a	a	a	a	a	a	a	a
Dulhunty	Lisa	N	F	1	0	1	1	1	0	0	0
Evans	Sarah	E	F	1	1	1	1	1	0	1	1
Frailion	Eveline	N	F	1	0	1	0	1	1	1	1
Kim	Si Young	N	M	1	1	1	0	1	0	1	1
Lissonnet	Gloria	N	F	1	1	1	0	1	1	m	1
Nguyen	Wei	N	M	1	1	1	0	1	0	0	1
Psiliakos	Lily	N	F	1	0	1	0	1	0	0	0
Robinson	Jane	E	F	1	0	1	0	0	1	1	1
Schultz	Boris	N	M	1	0	1	0	1	0	1	1
Stephanou	Anita	N	F	1	0	1	1	0	0	1	0
Thau	Tiffany	N	F	1	0	1	1	0	0	1	0
Tierney	Ana	N	F	1	1	1	0	1	0	1	1
Urbach	Thomas	N	M	1	1	1	0	0	0	1	0
Williams	Kim	E	F	1	1	1	0	1	1	1	1

In this example Wolfram and Jenny are the only students who have answered question 3 incorrectly, suggesting a particular weakness in this skill for these two students. Jenny has also missed 3 of the first 8 questions in the test suggesting that she has had problems with this test. Emily, Lisa, Sarah, Anita and Tiffany are the only students to have answered question 4 correctly, suggesting that the boys in your class had particular difficulty with this question.

If you use the Excel spreadsheet version of the Class report, you can first sort by mathematical literacy content areas and then look for patterns in individual response data for this content area. You can repeat the process for mathematical competencies. The same thing can be done for reading aspects and text types.

If you use the interactive report the display of individual student scores for each question is automatically shown along with the graphic display, allowing you to select all the mathematical content questions, view the graphic comparison with all others and identify individual student response patterns.

## Interpreting the data

Some patterns to note are:

- high instances of students missing particular questions which often indicates a lack of understanding of these questions;
- a student with a continuous block of missing questions which suggests this student may have turned two pages of the booklet at once and genuinely failed to see the questions missed, rather than electing not to try to answer them –you may wish to treat this student’s overall result more cautiously;
- students who answer the first few questions in the test incorrectly as these are generally among the easier questions in the test; and
- students who have answered many easy questions incorrectly and some hard questions correctly, which suggests, if these are mainly multiple-choice questions, that the student may have been guessing.