PERFORMANCE INDICATORS IN PRIMARY SCHOOLS

FEEDBACK REPORT
KEY STAGES 1 & 2

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Introduction

The intention of the PIPS Project is to provide high quality, confidential information for use by professionals within schools to promote improvement. Information is fed back regarding the self-concept (attitude) and achievement of individual pupils. Two types of achievement measure are provided. These are the levels of attainment reached and the relative progress (value-added) made in each curriculum area.

The purpose of this report is to describe the feedback that you will receive if you have taken part in any of the PIPS assessments available from the end of Year 1 through to the end of Year 6. The report has been kept as brief as possible whilst containing all of the information necessary for you to make sense of your feedback. For those requiring a fuller treatment there are additional publications available from the CEM Centre. Details of how to obtain these are given at the end of this report.

Assessment Options

Every year from Year 1 to Year 6 we offer a set of assessments that provide a comprehensive view of the pupils' attitudes and achievements. This includes assessment of reading and maths and, in Year 6, science.

At the end of Key Stage 1 and Key Stage 2 (Y2 and Y6), we can incorporate the national assessments instead of the PIPS assessments of reading, maths and science.

In the years when there is no end of Key Stage assessment, the measures of mathematics and reading are necessary to form a complete system. In Years 2 and 6 it is possible to omit the PIPS assessment of mathematics, reading and science (in Year 6 only) and to rely on the statutory tests. This is the **Basic** option.

The **Extended** option for Years 2 and 6 involve PIPS tests of reading, mathematics and science (at Year 6 only) but not the Key Stage assessments.

The **Full** option includes the statutory test data and the PIPS tests of reading, mathematics and science (at Year 6 only).

The options are summarised below:

	Attitudes, picture vocabulary and non-verbal ability	PIPS maths, reading & science[1]	Key Stage assessments	Scatterplots & value-added	Chances tables
Basic option	✓		✓	✓	✓
Extended option	✓	✓		✓	✓
Full option	✓	✓	✓	✓	✓

[1] Only in Year 6

Data Collection

The PIPS Project collects pupil level data for a range of variables. These data are used to determine each pupil's achievement and self-concept. The data collected are listed below:

- Predictors
  - *picture vocabulary*
  - *non-verbal ability*
  - *(cultural capital data are collected but not recorded in the feedback)*
- Cognitive Outcomes
  - *PIPS attainment measures*
  - *Key Stage statutory assessment results*
- Affective Outcomes
  - *Attitude to school*
  - *Attitude to mathematics*
  - *Attitude to reading*
  - *Attitude to science*

Predictors & Outcomes

Predictors and cognitive outcomes are the measures that are used to calculate value-added. Outcomes are the scores achieved in a curriculum dependent measure of attainment, for example a maths or reading assessment. Predictors are other measures that can be used to forecast the result of such an assessment.

The PIPS assessment materials provide outcome measures for mathematics, reading and, in Year 6, science. The Key Stage 1 outcomes analysed by PIPS are mathematics, reading and spelling. At Key Stage 2 the outcomes are mathematics, English and science.

Predictor and outcome measures derived from PIPS assessment materials are converted to standardised scores. These are reported on the Pupil Scores table (or Pupil Attitudes table for those doing the "basic" option), and are used for generating the scatterplots. Standardised scores are used in preference to raw scores because they allow straightforward comparisons between different parts of the assessment and also enable you to see how well your pupils are performing in relation to those in other schools.

Using standardised scores the average is 50 and the standard deviation is 10[1]. This means that 84% of the sample will always have a score of 40 or more. 16% will have a score of 60 or above. Pupils with scores below 30 and above 70 are exceptional. This is summarised in the following table:

range of standardised scores	proportion of pupils
less than 30	2.5%
30 to 40	13.5%
40 to 50	34.0%
50 to 60	34.0%
60 to 70	13.5%
more than 70	2.5%

Scores from the Key Stage assessments are not standardised. Key Stage levels are reported back in the tables and raw test scores are used to generate the scatterplots and value-added.

The predictors used by PIPS are the context and prior achievement scores. The context score is a measure of developed ability and is used to determine concurrent value-added. It is calculated from the picture vocabulary and non-verbal ability measures. The attainment and context scores from the previous PIPS assessment are combined into one prior score. This prior score can then be used to calculate the relative progress made by a pupil over that period of time. This is called the prior value-added. Obviously if a child has not been assessed previously using PIPS they will not have a prior score and we are therefore unable to calculate prior value-added.

[1] Technically they are known as T scores.

Self-concept (Attitudes)

Self-concept or attitude measures are generated for different curriculum areas and for school generally. They are reported on the Pupil Grades table (or Pupil Attitudes table for those doing the "basic" option).

The attitude scores are criterion referenced. We simply report back the child's average response for each category. Attitudes are reported within a row of 3 or 5 dots depending on the scale used to collect the data. The child's average response is highlighted within the row of dots (see table). Presenting the data in this way makes it easier to read and interpret.

years 1 to 4	years 5 & 6	average attitude
••☺	••••❺	positive
	•••❹•	
•😐•	••❸••	neutral
	•❷•••	
☹••	❶••••	negative

Achievement

As was noted in the introduction, PIPS reports achievement in terms of both academic attainment and relative progress (value-added). Academic attainment is reported in the form of standardised scores or Key Stage levels, as discussed in a previous section. In addition the PIPS standardised scores are reported back in the form of grades. Levels of attainment are given letter grades (A to E). The table outlines the distribution of these grades.

attainment achievement grade	proportion of pupils
A	10%
B	15%
C	50%
D	15%
E	10%

Achievement grades are reported in the Pupil Grades table and/or the Key Stage Levels table depending on if you are doing the "basic", "extended" or "full" option.

Value-added

As outlined in a previous section, there are two possible types of value-added. The first is based on the contextual assessment (non-verbal ability and picture vocabulary) giving a concurrent value-added. The second value-added score is based upon prior achievement giving value-added over time. This can only be calculated for those children that have previously been assessed using PIPS.

The value-added grade, which is represented using the scale --, -, 0, +, ++, shows how well a pupil has performed in relation to their context score or prior achievement score. Where a child scores '0' they are performing in line with expectations. In other words their attainment score is in line with the score predicted from their context score or prior achievement score. Therefore a value-added grade of '0' can be regarded as average. Those children with positive value-added (+ or ++) have done better than predicted, those with negative value-added (- or --) have not done as well as expected.

The proportion of children falling into each category is shown below.

value-added	proportion of pupils
++	10%
+	15%
0	50%
-	15%
--	10%

Schools that have been in the PIPS project long enough to receive prior value-added grades may find it interesting to compare these with their concurrent value-added grades.

Prior and concurrent value-added differ in what they use to predict a child's present level of attainment. Concurrent value-added uses the child's 'Context' score, that is a measure of developed ability, to predict their current level of attainment. In effect it gives us a snapshot of where the child is at this moment in time. By contrast prior value-added uses the attainment in previous assessments as the predictor. This gives us a measure of the child's progress up to this moment in time. To put it another way concurrent value-added tells us if a child is doing as well, better or worse than expected given their developed ability but tells us very little about how they got to that point. Prior value-added tells us something about the child's progress since the last PIPS assessment but little about whether we can expect them to do better still

continued

Value-added *continued*

It is possible to put children into one of nine categories according to their two value-added grades. This is summarised in the value-added grid below. The colours on the grid indicate how the children were probably performing the last time they were assessed using PIPS. Children that fall in the white boxes were probably ahead of similar children the last time they were assessed. Those in the light green boxes were probably behind similar children. The darker green boxes contain children that were on track the last time they were assessed.

It is tempting to speculate on the kinds of children that might be found in different parts of the grid. Those toward the top left-hand corner may include children that appear to be doing well but are in fact coasting. It may also contain children that have not been sufficiently challenged by the curriculum presented to them. The bottom right-hand corner may contain children who are catching up even though they could still do better. This could include children that have had some difficulties (settling into school, SEN etc) that are now being addressed. The top right-hand corner contains children that are really thriving. The bottom left hand corner contains children that are failing to thrive. This could indicate a special educational need. It could also indicate children with some other difficulty such as family problems, illness or disillusionment.

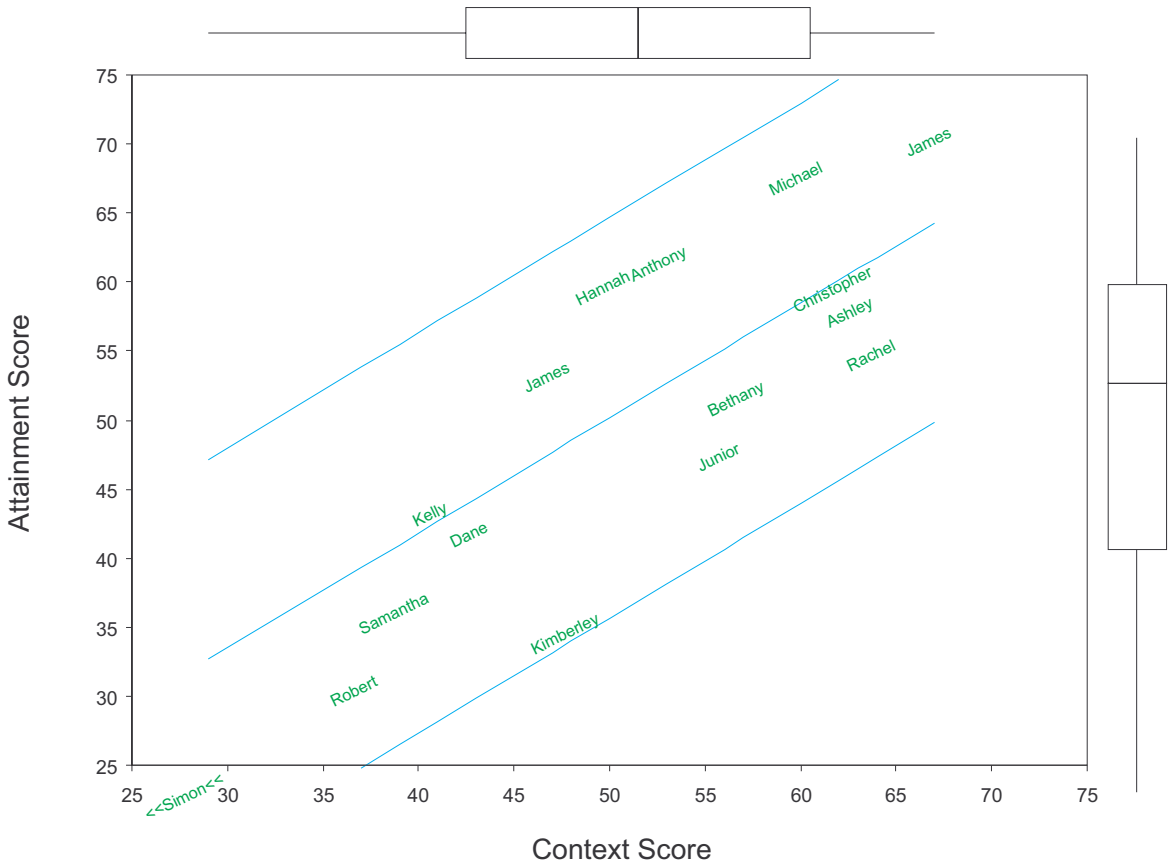
		Value-added Grid		
Concurrent Value-added	+ or + +	This child is doing better than expected, however they are no longer as far ahead as they used to be.	This child is doing better than expected and this may have been a consistent characteristic over time.	This child was probably on track before. They have made excellent progress and have now moved further ahead.
	0	This child is dong as well as expected. However, they have moved from a position where they were ahead of similar children	This child is on track and this is probably a consistent characteristic over time.	This child was probably underachieving before, however they have made excellent progress and are now on track.
	- or - -	This child was probably on track before but has fallen behind and is now underachieving.	This child is underacheiving and this may have been a consistent characteristic over time.	This child was probably underachieving before. They have made good progress but they still have some catching up to do.
		- or - -	0	+ or + +
		Prior Value-added		

Scatterplots

All of the scatterplots produced by PIPS plot a predictor score on the horizontal axis against an outcome score on the vertical axis. In the following example the context score is plotted against the maths score.

PIPS '02-'03
Year Five Start
Scatterplot

Subject : Maths
School : 1234567
Class : Example



The middle blue line is the regression line, also known as the line of best fit. Pupils falling on or close to this line are performing as expected. Pupils falling above this line are performing better than expected (i.e. they have a positive value-added) while pupils below the line are under-performing.

The two outer blue lines hold 95% of all pupils. Pupils above this line are performing well above expectations while pupils falling below the bottom line fall well below expectations. Teachers may well understand the reason behind such unusual scores. In fact the position of many of the pupils may well fit in with the teacher's perception. Some might, however, be unexpected and some further investigation would then be appropriate.

Some children with exceptionally high or exceptionally low scores fall outside the boundaries of the scatterplot. To indicate this chevrons are placed around their names. In the example above Simon, who actually scored 23 in his maths assessment, appears at the bottom of the chart as "<<Simon<<".

Each scatterplot contains two boxplots. These are useful for looking at the distribution of scores in the class. The boxplot at the top of the scatterplot refers to the predictor (e.g. context) score, while the one on the right hand side refers to the outcome (e.g. maths) score. The middle 50% of pupils lie within the box. The lines extending from the box represent most of the other pupils. Pupils lying outside these bands are called outliers. The line in the middle of the box represents the middle pupil in the class. The middle pupil in the whole project would score 50.

Chances Tables*

Chances tables show the chance of gaining each Key Stage level in the next statutory assessment. The chances are calculated separately for each child using their PIPS scores as a predictor. The overall average chances for all of the children of the same year group in the school are also calculated. The chances are calculated using a statistical model that was developed from PIPS and Key Stage assessment data collected in previous years.

What do the Chances Mean?

The easiest way to explain what the chances mean is to use an example. The Key Stage Two chances for an imaginary Year 5 class are given in the following table.

PIPS '02 - '03
Year Five Start
KS Chances

School : 1234567

		Keystage Two Chances (%)														
		Maths level					*English level*					*Science level*				
class	*name*	≤2	3	4	5	≥ 6	≤2	3	4	5	≥ 6	≤2	3	4	5	≥ 6
Year Group Average		**3**	**32**	**43**	**23**	**0**	**3**	**31**	**46**	**20**	**0**	**2**	**27**	**48**	**23**	**0**
Example	Simon	18	71	10	-	-	18	71	10	-	-	14	72	14	-	-
Example	Robert	10	71	19	1	-	10	71	19	1	-	7	68	25	1	-
Example	Samantha	4	61	33	3	-	4	60	34	2	-	3	53	41	3	-
Example	Kimberley	3	53	40	5	-	2	52	42	4	-	1	44	50	5	-
Example	Kelly	3	55	38	4	-	3	55	40	3	-	2	47	47	4	-
Example	Dane	3	53	40	5	-	2	52	42	4	-	1	44	50	5	-
Example	Junior	-	25	56	19	-	-	24	60	16	-	-	18	62	20	-
Example	James	1	31	54	14	-	1	30	58	12	-	-	23	62	15	-
Example	Bethany	-	17	56	27	-	-	17	60	23	-	-	12	60	28	-
Example	Hannah	-	22	56	21	-	-	21	61	18	-	-	16	62	22	-
Example	Christopher	-	13	54	33	-	-	13	59	29	-	-	9	57	34	-
Example	Ashley	-	10	51	39	-	-	9	56	35	-	-	6	53	41	-
Example	Anthony	-	15	55	30	-	-	14	60	26	-	-	10	59	31	-
Example	Rachel	-	8	49	42	-	-	8	54	38	-	-	5	50	44	1
Example	Michael	-	5	42	52	1	-	5	47	48	-	-	3	42	54	1
Example	James	-	2	30	67	1	-	2	34	64	-	-	1	29	68	3

Consider Simon's chances. These figures show that in previous years 18% of children with similar PIPS scores to Simon went on to get a Level 2 or less in their statutory maths assessment at the end of Key Stage Two. Seventy one percent of children like Simon went on to gain a Level 3 and 10% went on to get a Level 4. Almost no children with scores like Simon's in Year 5 went on to achieve a Level 5 or higher.

Using Chances Tables

Chances tables should be used with caution. They were generated using data from previous years and this may not agree exactly with what will happen in the future. For example we can say that 71% of children like Simon got a Level 3 in maths, but that does not necessarily mean that the same number will get a Level 3 next time.

When setting targets it may be useful to look at the "Year Group Average" which appears at the top of the table. It gives an estimate for the likely distribution of levels for the cohort at the end of Key Stage 2. It is more accurate than the results for one pupil because the level of uncertainty associated with the percentage chances decreases if you consider a group of children. In fact the larger the group the greater the confidence you can have in the overall average figures. In the example above we can say that the chances of getting a Level 4 or better in maths for the group as a whole is 66% (43% + 23%). In turn this means that about 66% of children might be expected to get a level 4 or above. This does not, of course, say which 66% of the children it will be!

Used in conjunction with teacher's judgements and a historical perspective of the school's results, a fair picture of what might be a reasonable target can be developed.

* NB Chances tables are not applicable in Scotland at the moment. Different chances tables are sent to Scotland (see letter attached to feedback).

Other Publications

The PIPS Project has produced a range of documents that enable you to explore many of the topics discussed here in more detail. Many of these are available from the CEM Centre for a small charge. Some example publications are given below, however the list is constantly being updated and revised. An up to date publications list is available from the CEM Centre and is also on our web site.

Baseline Assessment and Monitoring in Primary Schools: Achievements, Attitudes and Value-added Indicators, by Peter Tymms. *London: David Fulton*, 1999.

Analysing your school's data and setting targets for primary schools, by Peter Tymms. *Curriculum Evaluation and Management Centre*.

Using Concurrent and Prior Value-added. *Curriculum Evaluation and Management Centre*, April 1999.

Target-setting at Key Stage 2: An investigation carried out with the support of the NAHT, by Peter Tymms & Jane Stout. *Curriculum Evaluation and Management Centre*, May 1999.

IDEAS Software

IDEAS (Interactive Data Exploration & Analysis Software) is a software package available to the users of the PIPS Project. It allows schools to analyse their PIPS data in finer detail so as to gain the most from it.

The software provides facilities to:

- Create individual pupil reports
- Generate bar charts and frequency tables that give an alternative representation of the data
- Track progress of a cohort over time using longitudinal charts
- Compare prior and concurrent value-added using value-added grids
- Produce chances graphs and chances tables that can provide a useful guide for target setting
- Analyse data separately for boys and girls, for each class, or for any other criteria that may be of interest to you

The IDEAS software can be downloaded from the PIPS+ website. Please see the web site for details or telephone Brian Henderson on 0191 334 4223. The software requires a Windows based PC running Microsoft Excel.

www.pipsproject.org

Further Information

If you require further information about the PIPS Project you can contact us at:

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PIPS Web Site

The PIPS web site contains general PIPS information which is continually updated and includes:

- Latest PIPS developments
- Overview of all the assessments including examples of feedback, costs and timetables
- Details of forthcoming conferences and roadshows
- PIPS publications including newsletters, journal articles and reports
- How to book In-Service training
- Details of new PIPS assessments

The web site address is www.pipsproject.org

PIPS+ is a web site with specific school and consortium information. This enables teachers to:

- Print additional copies of feedback
- Download the IDEAS software and school specific data files
- Download MTF files for entering PIPS data into the SIMS Assessment Manager
- Check registrations and tracking information
- Receive a list of PIPS pupil identifier numbers
- Print copies of PIPS documentation
- Return Keystage and FSP results using online forms

As the site contains confidential school data a user name and password are required to gain access to the site. This is provided to schools with their paper feedback. If you have lost your username and password please go to www.pipsproject.org/password and complete the online form.

PIPS+ can be accessed, at no additional charge, by going to the PIPS web site (see address above), then clicking on the PIPS+ button.

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