Classroom Assessment

Purpose

The purpose of classroom assessment is to:

- obtain information on children's achievement and progress;
- assist teachers diagnose children's strengths and weaknesses, to improve teaching and learning; and
- assist teachers see their own performance.

Responsibility

The Head Teacher has the responsibility to ensure that the academic level of his student is high.

The Head Teacher is responsible to co-ordinate class tests in the school and to support class teachers in producing quality tests.

Policy

Teachers are to teach the full approved syllabus for the year level.

Teachers are to ensure students have learned the syllabus.

Teachers are to regularly assess students' progress through classroom assessments, and parents regularly receive reports on their child's progress.

Procedure

This procedure applies to summative tests, which require a plan, structure and analysis.

How to Build a Test Specification Table

Step 1 – Draw up the Specification Table

Draw a table like this:

SKILL/LEVEL / THEME	KNOWLEDGE	COMPREHENSION	APPLICATION	Questions Per Theme
Number and Numeration				
Operations				
Measurement				
Geometry				
TOTAL				

Step 2 Determine Number of Questions & Allocate to Skill/Level

(a)   The total number of questions to be asked is not fixed and should be decided by the teacher, e.g. 25,50, 100. Decide on the total number of questions for the whole test and enter this total (50 in our example below) in the last column of the "TOTAL" row.

(b)   The total number of questions allocated to each skill/level being tested will vary from level to level e.g. in Class 2 more knowledge questions will be asked whereas in Class 6 more comprehension and application questions will be asked. Using this as a guide, the teacher then makes his/her allocations. In our example, the teacher decides to allocate them as follows:

Knowledge: 10   Comprehension: 20   Application: 20   Total: 50

SKILL/LEVEL / THEME	KNOWLEDGE	COMPREHENSION	APPLICATION	Questions Per Theme
Number and Numeration				
Operations				
Measurement				
Geometry				
TOTAL	**10**	**20**	**20**	**50**

Step 3 – Allocate Questions According to Syllabus Theme

The number of questions for each theme is based on the proportion (%) of the num
lessons for each topic – such as:

Number and numeration:	15 lessons	= 17% of 90 lessons
Operations:	45 lessons	= 50% of 90 lessons
Measurement:	20 lessons	= 22% of 90 lessons
Geometry:	10 lessons	= 11% of 90 lessons

Therefore the number of questions for each theme is:

Number and numeration:	17% of 50 marks = 8 (rounded off from 8.3)*
Operations:	50% of 50 marks = 25
Measurement:	22% of 50 marks = 11
Geometry:	11% of 50 marks = 6

Enter the number of questions for each theme in the "Questions Per Theme" column.
Now our table looks like this:

SKILL/LEVEL THEME	KNOWLEDGE	COMPREHENSION	APPLICATION	Questions Per Theme
Number and Numeration				8
Operations				25
Measurement				11
Geometry				6
TOTAL	**10**	**20**	**20**	**50**

Step 4 – Calculate the Number of Questions on Each Syllabus Theme and Skill/Level

Now fill in the rest of the table with the number of questions for each theme and
skill/level.

To find the total number of items for each entry in the table, use this formula:

$$\frac{\text{total number of questions per theme} \times \text{total questions per skill/level}}{\text{total number of questions for the whole test}}$$

Therefore, the number of items for Number and Numeration testing knowledge will be:

$$8 \times 10 \div 50 = 80 \div 50 = 1.6 \text{ (round off)} \rightarrow 2$$

OR

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* You cannot write a "part" of a question, so round off to whole numbers

$$\frac{8 \times 10}{50} \quad = \frac{80}{50} = \quad 1.6 \text{ (round off)} \rightarrow 2$$

Our completed table now looks like this:

SKILL/LEVEL THEME	KNOWLEDGE	COMPREHENSION	APPLICATION	Questions Per Theme
Number and Numeration	2	3	3	8
Operations	5	10	10	25
Measurement	2	5	5	12
Geometry	1	2	2	5
TOTAL	**10**	**20**	**20**	**50**

Note that the number of questions per theme has been adjusted slightly to take into account rounding off of part-questions.

How to Interpret Test Results

Test results need to be thoroughly examined and interpreted so the teacher has a good picture of performance to provide directions for improved teaching and learning.

Some basic statistical calculations are necessary to help teachers improve their understanding of test results.

1. Mean

(a)   The mean (arithmetic average) can be calculated by adding up all the scores and dividing the sum by the number of scores.

(b)   The mean is a measure of 'Central Position' which balances the scores in the same way a see-saw operates.

(c)   The mean gives us a rough guide to the difficulty of the test – a high mean indicates a test the students found easy, while a low mean indicates a more difficult test. Remember, it is only a rough guide, as extreme scores can raise or lower the mean.

(d)   A mean of (say) 50 in a test out of 100 indicates a reasonably good test as 50 is half or 'centre' of 100 and therefore 'balances' the mark distribution.

Worked example – calculation of Mean score

Ten pupils obtained the following test scores: 8, 6, 8, 9, 9, 6, 8, 7, 11, 10

$$\text{Mean} = \frac{\text{Sum of scores}}{\text{number of scores}}$$

Therefore Mean $= \dfrac{8 + 6 + 8 + 9 + 9 + 6 + 8 + 7 + 11 + 10}{10}$

$= \dfrac{80}{10}$

$= 8$

2. Median

(a)   The Median is the score that cuts the a score distribution in half – exactly half th scores lie below the median and exactly half the scores are above the median. It the middle mark.

(b)   The median is also a measure of 'Central Position', like the mean. It is better tha the mean when there is a small number of extreme results in the group, for example a few very bright students.

(c)   The median gives us a rough guide to the difficulty of the test – a high median score indicates a test the students found easy, while a low median score indicates a more difficult test.

(d)   A median of (say) 50 in a test out of 100 indicates a reasonably good test as 50 is half or 'centre' of 100 and therefore 'balances' the mark distribution.

Example 1:

50

48

47   → median

46

40

In these five marks, 47 is the median because there are two scores above and two scores below.

Example 2:

When there is an even number of marks, there are two middle numbers.

50

50

48

47   } two middle numbers

46

40

The median is $\dfrac{48 + 47}{2} = \dfrac{95}{2} = 47.5$

In this case the median does not have to be a mark in the distribution.

3. Standard Deviation

(a)   The standard deviation is a measure of <u>spread</u> of test scores from the mean or median.

(b)   A test with a high Standard Deviation discriminates better between the bright and weak students than a test with a low Standard Deviation.

(c)   When combining raw marks from different tests or assessments the subject with the higher Standard Deviation will have more weight or influence in the composite score.

Methods of calculating the Standard Deviation

<u>3.1   Estimating using the "Top and bottom sixths"</u>

$$SD = \frac{\text{sum of top sixth} - \text{sum of bottom sixth}}{\text{half the number of students}}$$

1. Place the test scores in order from the highest to the lowest.

2. Find one-sixth of the ordered scores. This tells you how many scores from the top and bottom you are to use.

3. Add the scores within the top one-sixth of scores.

4. Add the scores within the bottom one-sixth of scores.

5. Subtract the sum of the bottom one-sixth from the sum of the top one-sixth and divide by one-half the number of students.

Example:

Test scores: 12, 11, 10, 9, 9, 8, 8, 7, 7, 7, 6, 5.

Sum of scores = 99.

Mean = $\frac{99}{12}$ = 8.25 (8, rounded off)

Number of student scores = 12

1/6 of 12 = 2.

Therefore add the 2 top scores, then the 2 bottom scores.

Half the number of student scores = 6

Estimate SD = $\frac{(12 + 11) - (6 + 5)}{6}$

$= \frac{23 - 11}{6}$

$$= 2$$

This method is useful if calculators are not available.

3.2   Using a calculator

Any calculator with a standard deviation function can be used. The procedure of how
do this is contained in the instruction book for the calculator.

For Casio fx82, fx90, fx100:

Enter SD mode	
Enter scores	Press **MODE** .
Press alternatively	
To find TOTAL	Press **M+**
To check number of scores entered	Press **Shift 5**
To find mean	Press **Shift 6**
To find SD	Press **Shift 7**
To cancel	Press **Shift 8**
To cancel SD mode	Press **AC**
	Press **Shift 0**

3.3   Calculating using the formula

Note: it is easier to use the calculator method.

$$SD = \sqrt{\frac{\sum(x - \bar{x})^2}{N}}$$

1. Calculate the mean $(\bar{x})$
2. Calculate the difference of each score from the mean $(x - \bar{x})$
3. Square the differences $(x - \bar{x})^2$
4. Add the squares $\sum(x - \bar{x})^2$

5. Divide the sum of the squares by the number of the scores $\dfrac{\sum(x - \bar{x})^2}{N}$

6. Take the square root $SD = \sqrt{\dfrac{\sum(x - \bar{x})^2}{N}}$

<u>Example:</u>

Find the SD of the scores 7,4,5,8,6

Score x	Difference from mean $(x-\bar{x})$	Square of differences $(x-\bar{x})^2$
7	7-6 = 1	1
4	4-6 = -2	4
5	5-6 = -1	1
8	8-6 = 2	4
6	6-6 = 0	0
		$\sum(x-\bar{x})^2 = 10$

$$\frac{\sum(x-\bar{x})^2}{N} = \frac{10}{5} = 2$$

$$SD = \sqrt{\frac{\sum(x-\bar{x})^2}{N}} = \sqrt{2} = 1.4$$

Recording test results in a record book

Information for each child such as raw marks and class position should be given to the parents in the child's report.

Use the following example as a guide to recording class results.

Names	Maths	Rank	English	Rank	Social Studies	Rank	Total	l
Anna	50	1	70	3	30	5	150	
Johnny	45	2	80	1	35	3	160	
Sylvain	35	5	60	5	33	4	128	
Rose	30	7	50	6	40	2	120	
Mary	32	6	30	9	45	1	107	
Jean	40	3	40	8	25	7	105	ε
Alain	45	2	75	2	29	6	149	3
Ulrick	36	4	65	4	20	9	121	5
Ephraim	35	5	45	7	22	8	102	9
Mean	39	■	57	■	31	■	127	■
SD	6		16		8		20	
Total	348	■	515	■	279	■	1142	■