ONE WAY TO USE MARKS WITH THE CURRENT SYLLABUS Term 1 2014: **Summary**

The ideas outlined below do not represent an ideal system. They represent a method by which teachers can use marks under the current flawed system. The system used here is cumbersome and problems with it are directly attributable to the way in which the QSA have set the rules on assessment.

Similar systems are already in use in many Queensland schools. Until now few of these schools have admitted to this system of using marks due to fear of censure from the QSA.

The strategy outlined in this document is applicable to academically strong schools with expectations of obtaining many VHA and HA students. A common practice in these schools is to provide a high proportion of 'A' standard questions in Supervised Assessments (exams). The use of marks, when many students obtain 'A' grades, allows teachers to more readily separate and rank students for the all-important SAIs at exit.

Using marks gives a much more accurate estimate of a student's Level of Achievement (LOA) and allows objectivity and transparency. There is no guesswork involved in awarding grades.

The system outlined below allows questions to be graded in marks and these marks are then used to find the Level of Achievement (LOA). Marks can be converted to letter grades on individual questions, however, it is the marks which are added to get an overall grade.

Many teachers now have a system which works and will not wish to do the work necessary to switch to marks, even though the use of marks gives a more accurate LOA. This is entirely understandable.

Marks are more accurate

The following example shows why marks are more accurate, transparent and objective. The student's mark in kcu for three term exams are shown together with the letter grade for each exam. Cut offs used here are shown in the attachment 'Mark Breakdowns for Plato' . The case below is a simplified example to demonstrate the superiority of marks over letter grades. It deals with C standard marks only. A real assessment would have A and C standard marks.

	Term I	Term II	Term III		Cumulative Grade
Mark	3.5 / 8	3.5 / 8	8 / 8	(= 15 / 24 = 5.0/8 average = C+)	C+
Grade	D	D	C+		C- to C

If the teacher was using letter grades, a Cumulative Grade of either C- or C would be awarded. Different teachers would award a different Cumulative Grade. There is no such doubt when marks are used. Not only is the use of marks more accurate, objective and transparent but the student can see exactly how much he or she needs to improve to move up a grade.

Changing from grades to marks

An example of an exam where this is done is shown in the file 'Practice exam for Plato'. For simplicity, this exam contains only C standard kcu questions and marks. The attachment 'Mark Breakdown for Plato' can be used to mark individual questions and then each question can be awarded a letter grade. The marks are then added up and a final letter grade is obtained as shown below.

Question	1	2	3	4	5	6	Total mark	Overall grade
Student's Mark	0.5/1	0/1	0/1	2/2	0.5/1	2/2	5/8	C+
Grade	C	E	E	C+	C	C+		C+ (obtained from the mark)

In this example the student just scrapes through with a C+ for kcu in this exam. The teacher can use the attachment 'Mark Breakdown for Plato' to put individual grades on each question as is done above. It is easier, and makes more sense, to simply add the marks and use the mark breakdown attachment to get an overall grade at the end. That is 0.5 + 0 + 0 + 2 + 0.5 + 2 = 5. And 5/8 on C standard marks gives an overall grade of C+. It should be obvious from the above example that a teacher would struggle to get an objective, transparent grade without marks.

For classes where there are a large proportion of SA students:

To comply with the current QSA rules for Physics and Chemistry a school should have two supervised assessments (SA), an ERT and an EEI in Year 11 and also in Year 12. This is a minimum. If students are struggling with the subject, this is a safe option as they have a higher proportion of assignment work. The assignment work can inflate their mark and assignments are generally less intimidating than exams. The down side is that, with assignments, the students may not learn much.

For classes where there is a large proportion of HA and VHA students:

These classes can use the assessment model outlined above. However, for classes with a large proportion of HA and VHA students, another proposition involves dropping the ERT and replacing it with a supervised assessment (SA). Students may be tempted to put in an inordinate amount of time on their ERT to get a good grade. If they have an assignment in another two science subjects plus Maths, the workload can be too great. Under the QSA's rules, if the ERT is replaced, the new assessment has to be 'different' form of assessment. The 'different' Term 3 assessment can take many forms. It can be a practical exam, a stimulus - response, a poster, a presentation or a prepared essay.

One way of doing the prepared essay option is detailed here. The student is given a series of lectures (2 or 3) about a certain topic, for example, "The danger of radioactive isotopes to humans." The lectures could outline the overview of the topic. The student is then asked to study two sources of radioactive nuclei and their effect on humans. Students can be asked to choose two sources of interest to them or the teacher can assign the topics. The student makes notes on these topics and brings these notes to the exam. The student is then, in the exam, presented with an unseen essay question on the "The danger of radioactivity to humans" and is asked to answer the question using examples from their own research. The essay is marked out of 8 A standard marks for kcu, ip and ec. The other part of the exam has the normal number of C standard marks for kcu, ip and ec and the questions come from the reduced amount of formal teaching done in this term. This 'different' SA exam is done in the same term as the EEI because there is less time for formal teaching in this term.

In addition some schools with a greater proportion of HA and VHA students also use an extra 'normal' SA. This is more than the QSA minimum and is *optional*. The extra SA gives the student a total of five assessments. This gives the student five chances to prove his or her worth. This makes each assessment worth less and thus reduces the pressure associated with each individual assessment.

The outline below is the same for Year 11 and Year 12. Year 12 is summative.

Term 1 SA exam: a mixture of C and A standard KCU, IP and EC questions

Term 2 as above

Term 3 EEI +
'different' SA assessment

Term 4 SA exam as in Term 1 and Term 2

Getting the balance right

For ease in adding, each assessment is weighted the same and is given the same number of marks. The marks set out below would best suit a fairly academic class as it has a large proportion of A standard marks. This allows the more able students more chances to perform well at A questions and more chances to get a VHA or HA. Students who are just managing to pass the subject will find these exams challenging, though they can still get part marks on the A questions and can still pass. If a teacher has a large proportion of SA students, the teacher may wish to increase the proportion of C standard marks so the exam is not as intimidating. Note however that this makes every A question more 'high stakes' for the HA and VHA students. Of course the teacher could also choose the QSA's minimum assessment of two SA's, an EEI and an ERT. In any case, the student's total **marks** are converted to **percentages** and these **percentages determine the LOA**.

In the system outlined here there are no B standard questions, though teachers may wish to include these. Some teachers feel that B questions are not much use as these questions do not allow a student to attain a VHA. These teachers feel that students can get a VHA, HA, SA, LA or VLA on an A standard question. The A questions are therefore of some use to all students. A student who wants a VHA however may consider that he or she is wasting their time doing a B standard question.

Students must be told to attempt all questions and this instruction should be written on the exam paper. This will prevent the VHA and HA students from skipping C standard questions in the hope that they perform well on the A standard questions. For example, a student who gets an A on the A standard questions and a C+ (that is the maximum) on the C standard questions will be awarded an A. This student must be discouraged from skipping the C standard questions to spend more time on the A standard questions. It should be pointed out to students that they need to show proficiency in a range of questions.

The Term 1, 2, 3 and 4 SA exams in this example have 8 C standard marks in the kcu, ip and ec categories. The number of actual questions may vary. Each of these exams also has 8 A marks in the kcu, ip and ec categories. Generally this is attained by having two 4 mark questions in each of the three categories.

The EEI is also considered an A standard assessment in this system. The student can be marked using a Criteria Sheet and these results can then be converted to a mark out of 8 for each of kcu, ip and ec. A teacher can also mark the EEI out of 8 in each of kcu, ip and ec. Each assessment in this example has a total of 8 marks however the teacher could use any number of marks. Marking out of 10 may be considered.

At the end of the year the student's mark profile will look like this if the teacher has a class where there is a large proportion of HA and VHA students:

	C standard marks kcu ip ec	A standard marks kcu ip ec
Term 1	/8 /8 /8	/8 /8 /8
Term 2	/8 /8 /8	/8 /8 /8
Term 3 EEI	no C marks	/8 /8 /8
'different' SA	/8 /8 /8	/8 /8 /8
Term 4	/8 /8 /8	/8 /8 /8
Totals	/32 /32 /32	/40 /40 /40
	96 C marks in total	120 A marks in total Grand total = 216 marks
convert to kcu% ip% ec%		convert to kcu% ip% ec%

There are a total of 44% C standard marks (=96/216) and 56 % A standard marks (= 120/216). The balance of C and A marks is entirely up to the teacher. Some schools use 50% C and 50% A standard while others may use 60% C and 40% A.

CUT OFFS

For marking individual questions and papers: see document Mark Breakdown for Plato. This spread sheet shows how individual questions can be marked. For example a kcu, ip or ec C standard question which is worth 4 marks gets a C+ if the student receives 2.5 / 4 or more. For an A standard question, from the spread sheet, a student who received 1 mark in a 4 mark question would get a D on this question. In practice, it is much easier to add up all the C marks and then use the spread sheet to give a grade at the end of marking each section. The same is done with the A standard marks. The higher grade is recorded in the profile. So a student who received, in the C questions, a C+ for kcu, a C for ip and a D for ec and also received, in the A section, C for kcu, B for ip and C for ec would have a profile entry of C+ for kcu, B for ip and C for ec. Problems can arise with this however (see below).

For totals at the end of the year the following cut offs can serve as an example. The actual cut offs used would be up to the teacher. These cut offs are close to the cuts off given in the attachment 'Mark Breakdown for Plato' but students need to be informed that the cut offs below are for totals and as such are much more accurate than individual grades given on individual assessment items. That is, these % cut offs, since they are being used on the sum total of all assessments for a year, are the ones that will be used to determine the overall grade for the year.

A standard kcu ip ec
>90% = A+
81-90.0% = A
75-80.9% = A-
69-74.9% = B+
62-68.9% = B
56-61.9% = B-
51-55.9% = C+
46-50.9% = C

40-45.9% = C-
33-39.9% = D+
27-32.9% = D
22-26.9% = D-
<22% = E

% cut offs for end of the year totals continued…

C standard kcu ip ec
> 62% = C+
56-61.9% = C
50-55.9% = C-
41-49.9% = D+
31-40.9% = D
22-30.9% = D-
<22% = E

These cut offs are a suggestion only. If the exam turned out to be easier than intended, the cut offs can be adjusted upwards. If the exam is harder, the cut offs can be adjusted downwards. This reflects the QSA philosophy of 'professional judgement' underpinning the system. The bottom line is that the student work must reflect the syllabus standards which are to say the least vague.

A student can get a SA, LA or VLA on the C standard questions. He or she can attain the full range of grades on the A standard questions. The best grade is recorded on the profile, as detailed above and below.

Once the LOA grades are awarded, the letters can be added in the normal way to obtain a final grade or percentages may be used. If, for example, a student receives a B in kcu, a B+ in ip and a B- in ec, the overall grade is B. This step will not be outlined further as teachers are already competent at this part of the process.

cohort name here					11 Term 1 Exam						11 Term 2 Exam						11 Term 3 EEI						11 Term 3 Exam						11 Term 4 Exam					
					S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A
marks allocated					8	8	8	8	8	8	8	8	8	8	8	8		8		8		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Student Number	Student Name	Teacher	Status	KCU		IP		EC		KCU		IP		EC		KCU		IP		EC		KCU		IP		EC		KCU		IP		EC	
1	JONES Jennifer	X	ft	4.5	2.3	5	2.3	4	5	5	3.5	3	3.5	7	3.5		6.5		5.8		5.3	4	1	5.5	1	1	4	6.3	4.5	4	3	4	4

The 'S' column is for C standard marks and the 'A' column for A standard marks. The better of the two grades is entered into the profile.

C D C+ D C- B

SEMESTER	ASSESSMENT TASK	KNOWLEDGE & CONCEPTUAL UNDERSTANDING					INVESTIGATIVE PROCESS					EVALUATING & CONCLUDING					
		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
1	1. SA exam (monitoring)			X					X				X				
	2. SA exam (monitoring)			X					X					X			
2	3. EEI (monitoring)	X						X					X				
	4. SA exam (monitoring)				X				X					X			
	5. SA exam (monitoring)		X							X				X			
	MONITORING	C					C					C+					C

Now the marks are used to get the final LOA for monitoring. Using the kcu marks this student gets:
C standard marks 4.5/8, 5/8, 4/8 and 6.3/8 = 19.8/32 = 61.8% From the table above this gives a C.
A standard marks 2.3/8, 3.5/8, 6.4/8, 1/8, 4.5/8 = 17.7/ = 40% From the above, this gives a C-.
The better result (C) is entered into the profile as the LOA for kcu.

A Potential Problem

There is a potential problem with this system. Since marks are being used, an accurate mark underpins the less accurate letter grade. Take as an example a student who gets the following marks for kcu:

	C kcu	A kcu	Term Grade
Term 1	5/8 = C+	2/8 = D	C+ (the higher grade)
Term 2	2/8 = D-	4.25/8 = C+	C+ (the higher grade)

Sem Res 7/16 (=3.5/8 = D) 6.25/16 (= 3.13/8 = D+) D+ (the higher grade)

A student may question how he or she can get a C+ and a C+ in two term reports, but get an overall grade of D+ for the semester. The D+ comes from the use of marks which are much more accurate than letter grades. Students must be warned that this situation can arise and is a result of the QSA system of C standard and A standard questions. It is the QSA system which throws this problem up. Thankfully it happens only rarely.

The system outlined above is overly complicated because it fits in with all of the current QSA rules. Individual teachers can use the general principles outlined in ways that better suit their own classes. The above system can also be simplified, but in doing this the teacher may breach the QSA dictates.

A far more simple system will be possible when the QSA is no longer setting the rules.

Some Practice Exam Questions for PLATO

C Standard KCU

Question 1. Determine the order of magnitude of

(a) x, where x $= 3.90 \times 10^{8}$ 0.5 mark if correct

(b) y, where y = 1.47×10^{-5} 0.5 mark

(1 mark)

Question 2. How many significant figures are there in the following measurements:

(a) 0.091 704 cm marks as above

(b) 4.150 kg

(1 mark)

Question 3. Write the following quantities in scientific notation with the correct number of significant figures.

(a) 0.007 150 km marks as above

(b) 151 200 s

(1 mark)

Question 4. For each of the following, state

(i) whether it is a vector or a scalar quantity

(ii) the correct SI units for that quantity

(a) distance 0.5 mark for each correct answer

(b) velocity

(c) mass

(d) time

(2 marks)

Question 5. Convert the following quantities.

(a) 2143 cm^3 to m^3. marks as above

(b) 164 $km.hr^{-1}$ to $m.s^{-1}$.

(1 mark)

Question 6. John strikes a soccer ball such that it leaves his foot with a speed of 25.0 $m.s^{-1}$. If it takes 4.00 s to come to rest,

(a) how far does it travel? 1 mark each

(b) what is its acceleration during the 4.00 s?

(2 marks)

MARKS BREAKDOWN FOR PLATO

A MARKS

8 MARKS TOTAL		A 4 MARK QUESTION divide first list by 2
8.00	A+	
7.75	A+	
7.50	A	
7.25	A	
7.00	A	
6.75	A	
6.50	A	
6.25	A-	
6.00	A-	
5.75	B+	
5.50	B	
5.25	B	
5.00	B	
4.75	B	
4.50	B-	
4.25	C+	
4.00	C	
3.75	C	
3.50	C	
3.25	C-	
3.00	D+	
2.75	D	
2.50	D	
2.25	D	
2.00	D	
1.75	D-	

C MARKS

C 1 MARK QUESTION		C 4 MARK QUESTION		C 5 MARK QUESTION		8 MARKS TOTAL	
1.00	C+	4.00	C+	5.00	C+	8.00	C+
0.75	C	3.75	C+	4.75	C+	7.75	C+
0.50	C	3.50	C+	4.50	C+	7.50	C+
0.25	D	3.25	C+	4.25	C+	7.25	C+
0.00	E	3.00	C+	4.00	C+	7.00	C+
		2.75	C+	3.75	C+	6.75	C+
		2.50	C+	3.50	C+	6.50	C+
C 2 MARK QUESTION		2.25	C	3.25	C+	6.25	C+
2.00	C+	2.00	C-	3.00	C	6.00	C+
1.75	C+	1.75	C-	2.75	C	5.75	C+
1.50	C+	1.50	D	2.50	C-	5.50	C+
1.25	C	1.25	D	2.25	D+	5.25	C+
1.00	C	1.00	E	2.00	D	5.00	C+
0.75	D	0.75	E	1.75	D	4.75	C
0.50	D	0.50	E	1.50	D	4.50	C
0.25	E	0.25	E	1.25	D	4.25	C
0.00	E	0.00	E	1.00	E	4.00	C-
				0.75	E	3.75	D+
				0.50	E	3.50	D
C 3 MARK QUESTION				0.25	E	3.25	D
3.00	C+			0.00	E	3.00	D
2.75	C+					2.75	D
2.50	C+					2.50	D
2.25	C+					2.25	D
2.00	C+					2.00	D-
1.75	C					1.75	D-

1.50	E
1.25	E
1.00	E
0.75	E
0.50	E
0.25	E
0.00	E

1.50	C
1.25	D
1.00	D
0.75	E
0.50	E
0.25	E
0.00	E

1.50	E
1.25	E
1.00	E
0.75	E
0.50	E
0.25	E
0.00	E