

## Formative Assessment in Physics

### Background – Phase 1 (2002-3)

1. Only operated in Lower Sixth.
2. Students self-assessed each homework before handing it in for marking by the teacher. There were standard sheets for this, one for practical reports and one for sets of questions.
3. We added comments to the sheet, including a target for the next homework of the same type. We recorded percentages but only revealed them to the students periodically, e.g. when they were getting a test mark (every 4-6 weeks).

### Phase 2 system (2003-4)

1. System operated in both Lower and Upper Sixth.
2. **Peer marking** for half the main home-works. Students worked in pairs and marked their partner's homework, using either the worked solutions (questions) or the criteria (practical reports). We circulated and helped as appropriate, and made a note of those who had missed the deadline; they spent the time working on the homework task. Quick workers did extension question, if not done already, and sometimes a Challenge question. Plenary session where we asked for comments/questions, highlighted important points and pitfalls. Students were encouraged to attend a subject tutorial to receive further help if necessary.
3. **Traffic lighting** for self and teacher assessment: Red (not much understanding), Amber (got it to some extent), Green (good understanding/performance).
4. No more secret percentages; we recorded percentages only for tests, otherwise only Red/Amber/Green.
5. **Subject tutorials** were only compulsory for Red as assessed by us (from a homework or test); optional for Ambers and self-assessed Reds.
6. **Target record sheet** for students to record targets we set and those they set themselves. They kept this in their file.
7. Tests were slightly more frequent.

### Issues discussed during the year

- Some people were good at peer marking, while others found it difficult to do, or were too lenient over the quality of answers, particularly verbal ones. Others didn't take it seriously. One teacher took the marked work in occasionally to check the quality of work and marking.
- However, we didn't seem to have any problems with students feeling sensitive about comments from their peers.
- Some classes were very good at completing work for the deadline, while in others the large numbers who hadn't undermined the exercise.
- They seemed to find it useful to have the immediate feedback on the question homework.
- Students found it difficult to mark practical reports. We tried to help by highlighting the specific criteria to look out for, or any specific content, before they did the marking, which helped to some extent.
- At an early stage we realised that traffic lights that we gave were functioning like grades i.e. not in the spirit of Formative Assessment! We tried to downplay them subsequently, or emphasise that they were meant to be advice on further action rather than a judgment of achievement.
- In any case, it was difficult to traffic light practical reports. We decided to focus on one or two sections each time e.g. method and evaluation, rather than the overall quality or the theory content.
- Target sheets weren't being used well. We didn't often refer to them when the homework was set or returned. We considered keeping an extra set in the department but it was difficult to remember to bring them out each time.

**Ideas for next year (phase 3)**

- Abandon traffic lighting (except as optional method for teacher records)
- Try “spoof marking” to develop skills in writing practical reports – yet to be planned
- Possible modifications to format of peer marking sessions and use of target setting sheets – to be decided.

**Comments on the college process**

It was good to have staff time to reflect and discuss and develop resources. Had we had a guest from another institution we might not have been able to achieve as much, and felt pressure to advise others. The INSET day in November was interesting but introduced yet more ideas, that were interesting but too much to try in addition. We would like a similar time allowance next year in order to keep developing the project.

**Student feedback obtained so far**

- 6U evaluation questionnaires in May 2003
- 6L evaluation questionnaires in June 2003 – details given
- 6L focus group in June 2003
- 6L and 6U focus groups in October 2003
- 6U evaluation questionnaires in May 2003 – details given

**Examples of resources used**

## Phase 1

- Student self-assessment sheet for question homework
- Student self-assessment sheet for practical report homework

## Phase 1 and 2

- Example of question homework sheet (“Equations of motion”)
- Worked solutions for the question homework
- Example of practical report homework sheet (“Density of glass and sand”)

## Phase 2

- Homework schedule for Unit 1 (shows which homework was teacher marked)
- Target sheet

**Appendix A: Physics homework assessment form for Questions**

Questions on .....

Name: .....

<b>Target from my last Questions homework:</b>	<b>Teacher comment:</b>

Before you hand in your homework for marking, assess how well you think you have done it by completing the self-assessment sections below. How good do you think it is? Have you managed to keep up a good standard, or to improve on any of the criteria since last time?

Criteria	Self assessment			Teacher comment
	Needs improving	Average / OK	Good	
1. Understand and use the physics involved in these questions				
2. Select the correct method for calculations or relevant information for explanations.				
3. Present your calculations in a logical way, showing all your working.				
4. Calculate accurately and give your answers with the correct units.				
5. Write explanations which are clear and logical, complete but also concise.				
6. Use physics terms correctly.				
7. Interpret diagrams and graphs, and draw them correctly.				
8. Apply your knowledge to hard questions as well as straightforward ones.				

<b>Self-assessment:</b> Strengths:	<b>Teacher comment:</b> General:
What most needs improving next time?	Target for your next Questions homework:

**Appendix B: Physics homework assessment form for Practical Reports**

Report on .....

Name: .....

<b>Target from my previous homework:</b>	<b>Teacher comment:</b>

Before you hand in your homework for marking assess how well you think you have done it by completing the self-assessment sections below. How good do you think it is? Have you managed to keep up a good standard, or to improve on any of the criteria since last time?

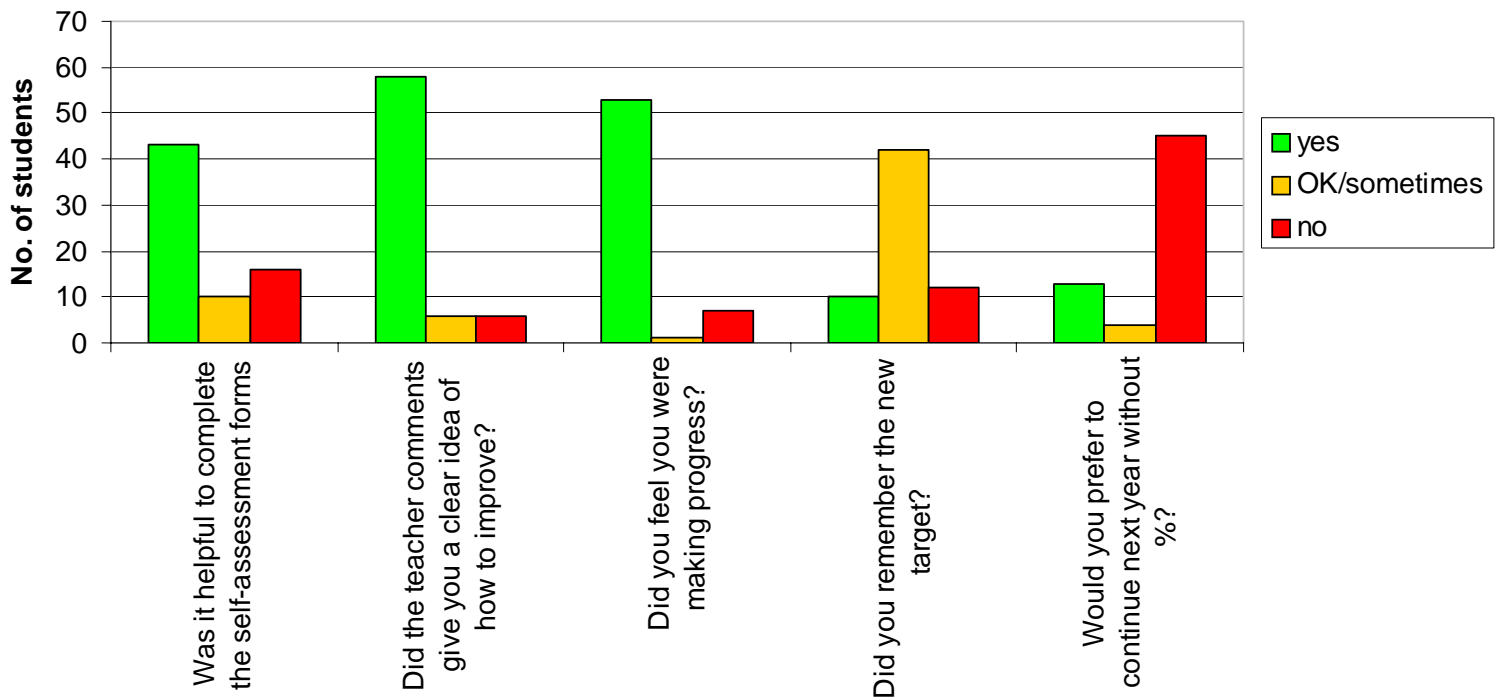
Criteria	Self assessment			Teacher comment
	Needs improving	Average / OK	Good	
1. Draw a clear, labelled diagram of equipment				
2. Write a complete but concise method for the experiment				
3. Describe the precautions taken.				
4. Record all the results, in tables where appropriate, and with units.				
5. Draw a graph with a sensible scale, labelled axes, correctly plotted points and a good line or curve of best fit.				
6. Calculate the gradient and other values as appropriate. Show working and give answers to a sensible number of significant figures with units.				
9. Comment on any patterns in the data and draw a conclusion, using your knowledge of physics.				
10. Comment on sources of error in the experiment, and how reliable your data and conclusions are.				

<b>Self-assessment:</b> Strengths:	<b>Teacher comment:</b> General:
What most needs improving next time?	Target for your next practical report:

**Appendix C: Questionnaire results for cohort of AS/A2 physics students (2002-2003)**

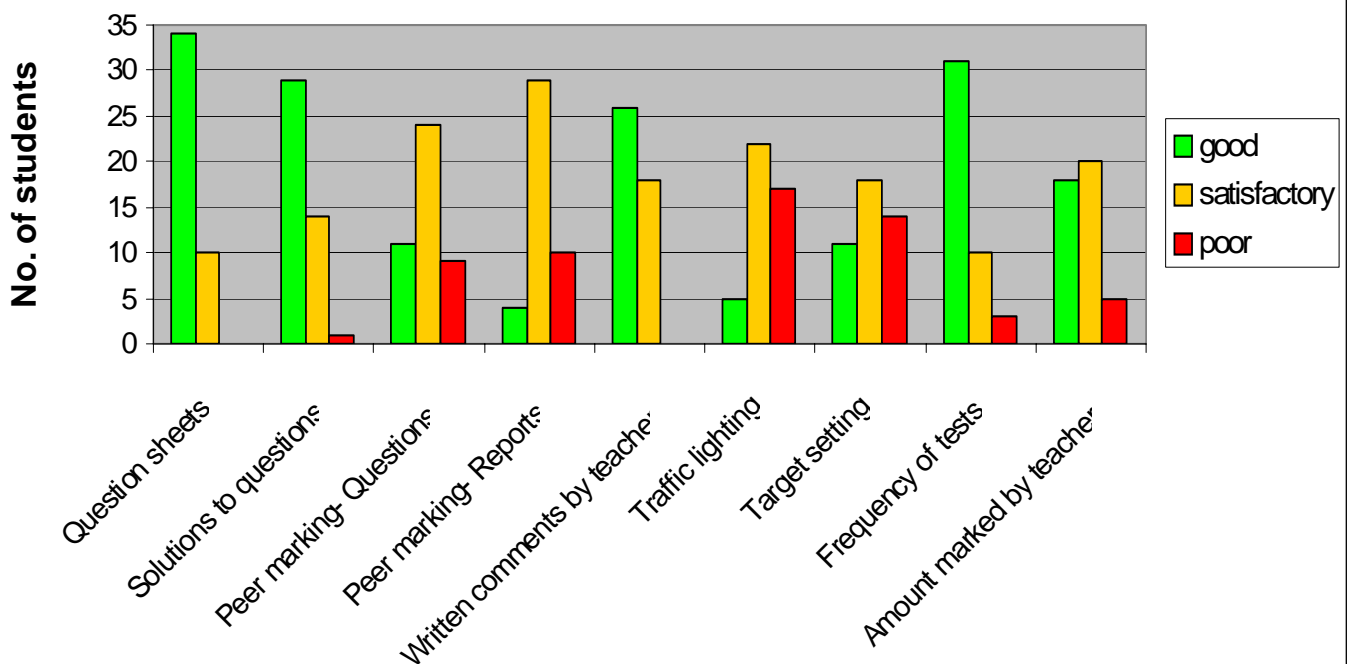
**AS 2002-2003**

**6L Student responses to Assessment in physics at AS (02- 03)**



**A2 2003-2004**

**6U Student responses to Assessment in physics at A2 (03- 04)**



**Comments from AS questionnaire:**

'It makes you think about the work.'

'Showed me where I constantly made mistakes'

'Hard to assess your own performance.'

'Rarely met targets therefore did not feel like I was making progress – in fact the opposite.'

'Not having a percentage is good as it doesn't discourage you or make you feel like you are doing better than you actually are. But I do like getting the percentages as it shows generally how well I am doing. Tests did give a good enough idea.'

'Percentages are required to show how well you are performing compared to others.'

**Comments from A2 questionnaire:**

'I would prefer % achieved .... as well as targets. I think this year's approach was less helpful.'

'With the system this year it is more difficult to keep track of how we are doing on each topic – last year we did usually get percentages in the end. Marking the work using mark-schemes is more helpful in that I can see exactly what I did/didn't get right ....'

'This year's approach is more straightforward....With the green and yellow sheets we were left in the dark not knowing how well or poorly a homework was done.'

'I would prefer straight teacher marking and % - provides good incentive. Fine to include targets - good for some students but pointless if you get the same target every week (i.e. "do extension")'