PEARSON ALWAYS LEARNING

DELEGATE BOOKLET

Getting Ready to Teach – GCE Physics 2015

14GBAS01

Activity 1 – Planning a Topic

Purpose:

- To focus on a new topic
- To identify which mathematics statements apply
- To identify the applicable statements from Appendix 5c
- To explore how this topic can be used for CPAC

Task: Planning for Lenses - Specification statements

75. understand the term *focal length of converging and diverging lenses*	
76. be able to use ray diagrams to trace the path of light through a lens and locate the position of an image	
77. be able to use the equation power of a lens $P = 1/f$	
78. understand that for thin lenses in combination $P = P1+P2+P3+\ldots$	
79. know and understand the terms *real image and virtual image*	
80. be able to use the thin lens formula for a converging or diverging lens with the 'real is positive' convention	
81. know and understand that magnification = image height / object height and $m = v/u$	

1. Go to Appendix 6 on page 87 of the specification and write in the box alongside each specification statement which mathematical skill number (eg C0.3) applies to this work.

2. Turn back to Appendix 5c on page 81 and identify which of the 12 techniques apply to any practical work and write the paragraph number alongside the maths skill code in the table above.

3. Turn back to page 48 and decide how you might use the practical work and which criteria you might assess your students on. It might help to order the specification statements into a teaching order.

Activity 2 – Using the Core Practicals and the Practical Support Guide

Purpose:

- To review the practical activities in the practical support guide and consider the skills of planning and analysis that are required
- To review coverage of specification topics and Appendix 5c
- To investigate how the practical activities can be used for the CPAC

Task

1. Look at the list of practical activities and the document on coverage of 5c and CPAC. Compare the list with specification topics and see if there are any further gaps that might be filled.
2. Look at the Sample of the Practical Guide. These sheets show how the practical guide will be laid out for all 15 activities. Identify how the technician, teacher and student sheets fit together to provide a coherent description and instruction on carrying out the practical and the activities associated with it.
3. Identify the 5c statements not covered by this list. Consider which second year practical activities might fill these gaps.
4. Consider which activities you could use to assess your students against each CPAC statement and how you might brief the students. Do not consider CPAC 2 at this stage as that is the next activity.

Activity 3 – Towards a practical mastery

Purpose:

- To consider what a practical mastery might 'look like' in an A level student
- To consider CPAC 2 and how students can use the practical work to develop their investigative skills over 2 years

---

Task – Use the CPAC, the list of practical work and the Practical Guide

- Look at the Notes on Core Practicals and Maths Skills
- Look at the investigations listed and consider how they might contribute to CPAC 2
- Consider progress from GCSE to A level mastery
- Consider how this might be achieved in an ordinary curriculum timetable

Notes

Activity 4 – Review the Sample Assessment Material

Purpose:

- To look at the design of multiple choice items and the ramping of demand through the paper
- To note the free response questions and synoptic questions
- To see how the new marking of 6 mark questions depends on the line of reasoning
- To look at the mark schemes to be able to better understand the standard

---

Task – Look at the following questions

Paper Question & Style	Topic	Point to note
A Level Paper 1 Q2 – m/c	Energy stored in capacitor	Calculation not required
Q7 – m/c	Power in resistors in series	AS topic on A level paper, harder?
Q9 – m/c	Particles	Which is NOT – more demanding not more difficult
Q11 - short	Alpha scattering	Demanding but not difficult, as is shown by the answer
Q12 – short	Moments	Back in! This A level question is probably easier than Q11 on AS paper 1 but part b is more recognisable
Q13 - short	Potential divider	Requires use of data from a log axis graph
Q14b - calculation	Kinematics	Simple MS giving credit for correct physics
Q15a - explanation	Falling in a resistive medium	Rather more complex question. First interpret the information then explain it. Look at the mark scheme.
Note the asterisk beside the (a)*. This means the mark scheme rewards logical reasoning. The 'indicative content' might be known as 'the physics'. So there are 4 marks available for 6 bits of correct physics and then up to 2 marks for linkage and the line of reasoning. There will be some exemplar material produced with sample answer to show what sort of answer this MS rewards. Research shows that good physics students are seldom penalised as their arguments are usually as good as their physics		
Q16	Electromagnetic induction	Part a has the same sort of mark scheme but note that bi has only 1 mark and that biii uses data (from AO3)
Q18c - data	Charge moving in a magnetic field	Use of data but look at MS – uncertainties. Example of practical work in written paper
Q19b - data	Capacitor discharge	Marks given for any correct route
A Level Paper 2 m/c	Qs 4, 5, 6, 9 & 10	All require conclusions to be drawn from data mostly supplied in graphical form (AO3)
Q11 – definition and calculation	Binding energy	Fairly straightforward – low demand – question at start of paper ie after the m/c
Q13 - explain	Sound propagation	Two part question and the asterisk make this a high demand question but on an AS topic

Q17 - explain	Latent heat	Back in!
Q19 & others	Plenty of data to analyse, some quantitatively and some qualitatively (AO3)	
A Level Paper 3	No multiple choice questions	
Q1 – data & practical	Context not important but it is a core practical	Maths and choice of instrument (planning)
Q2 – data based conclusion	Sound practical – not core	Use of uncertainties (analysis)
Q3 - describe	Electrical practical - core	Very much easier to do if candidate has done the practical. The data analysis in b is not what you might first expect
Q4 - short	Practical – not core	Criticise results and suggest method. MS lowers the demand since there are more marking points than marks
Q5 - long	Oil drop experiment	Most candidates unlikely to have sen this practical, question is difficult and demanding
Q6 - long	Electromagnetic induction	First question not based on practical work or data, part (b) is synoptic in that it ranges over different specification points
Q7 - data	Compound pendulum	Lines of best fit are not always straight
Q11 – practical and data	Inverse square law	There is almost certainly going to be a graph to plot between two non-linearly related variables as this is an appendix 5a point
Q13 - practical	Oscillations	Candidates will need to be confident in their practical work to be able to score highly here
AS Paper 1&2 Section B		
Paper 1 Q16	Stress and strain of an optic fibre	Practical aspect and graph plotting is required
Q17	Electric current and optics of a CD	This mixture has an asterisk Line of reasoning mark scheme
Paper 2 Q16	Electric current and optical interference	Free response answers and something of a comprehension exercise
Q17	Energy stored in a stretched elastic and kinetic energy	Again a strong practical aspect. Mark scheme for both questions clear enough