Delegate Booklet

Course Title: **Developing Practical Skills in Physics**

17BAS04

Prepared by Pack Production 2016

About this event

Course Title: Developing Practical Skills in Physics

Course Code: 17BAS04

Aims and Objectives of the event

1 An overview of practical work at A level

2 Using the Core Practicals in your teaching to address the practical skills and competencies

3 The assessment of practical work

4 Developing your curriculum to give your students the investigative skills to work towards a practical mastery

5 Evidence and the visit

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Agenda

Time	Item
9.30	Welcome Tea & Coffee
10.00	Agenda & Introductions
10.10	An overview of practical work and skills at A level
10.40	Using the Core Practicals
11.50	The assessment of practical work – the 2017 examination papers…
12.30	Lunch
1.15	…and the Practical Endorsement
2.45	Developing your curriculum to give your students the investigative skills to work towards a practical mastery
3.35	Evidence and the visit
3.45	Course completes

Activity 1 – Looking at the requirements of Appendix 5c

Purpose:

- To divide the list of Appendix 5c into Apparatus and Techniques
- To help delegates keep in mind the nature of the activities when drawing up a Scheme of Practical Work

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Task

On the left hand side of the list below write an A or a T to show whether the activity refers to Apparatus or Technique

Appendix 5c

1. Use appropriate analogue apparatus to record a range of measurements (to include length/distance, temperature, pressure, force, angles, volume) and to interpolate between scale markings.

2. Use appropriate digital instruments, including electrical multimeters, to obtain a range of measurements (to include time, current, voltage, resistance, mass).

3. Use methods to increase accuracy of measurements, such as timing over multiple oscillations, or use of fiduciary marker, set square or plumb line.

4. Use stopwatch or light gates for timing.

5. Use calipers and micrometers for small distances, using digital or vernier scales.

6. Correctly construct circuits from circuit diagrams using DC power supplies, cells, and a range of circuit components, including those where polarity is important.

7. Design, construct and check circuits using DC power supplies, cells, and a range of circuit components.

8. Use signal generator and oscilloscope, including volts/div and time-base

9. Generate and measure waves, using microphone and loudspeaker, or ripple tank, or vibration transducer, or microwave/radio wave source.

10. Use laser or light source to investigate characteristics of light, including interference and diffraction.

11. Use ICT such as computer modelling, or data logger with a variety of sensors to collect data, or use of software to process data.

12. Use ionising radiation, including detectors.

Activity 2 – Identifying CPAC opportunities for each Core Practical

Purpose:

- To identify all the CPAC statements that can be used with each of the Core Practicals
- To give delegates the opportunity to think about the ways each Core Practical can be used
- To enable delegates to use this work in drawing up a Scheme of Practical Work

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Task

You will need the blue sheets of paper. These include the Notes sheet for Activity 2, the List of Practical Activities and the sheet of CPAC details.

The Notes sheet shows the Core Practicals and the 5c requirements that it fulfils. Column 4 shows the revised (August 2017) suggestions for CPAC assessment.

Working as a pair consider each core practical and add in column 4 any other CPAC statements that could be assessed using this practical. Discuss also whether this practical activity might be used as an investigation, what apparatus challenges it might represent and how you might do this activity differently.
Try to address each of the three issues for each practical and use the sheet to record brief notes. We shall discuss each practical together afterwards and use the thoughts recorded in drawing up a Scheme of Practical Work this afternoon.

You have 30 minutes to cover 16 core practicals.

Activity 3 – Using Pen portraits

Purpose:

- To explore how pen portraits can be developed
- To discuss how pen portraits can be used to standardise colleagues
- To consider the stability over time in judgements about student competence
- To consider how students might use pen portraits in moving towards a practical mastery

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Task

You will need the sheets printed on yellow paper. These are the student sheets from the worksheets for core practicals 12 and 9 and 7 sheets of blank forms for you to complete.

A pen portrait is a brief description of what an assessor might see when looking for evidence in the laboratory in order to come to a judgement of a student's competence – this can come from observation or question. One is shown below for the whole of CPAC 2 and is perhaps a little cumbersome whilst giving a good example. We will cover that together.

We shall now write some pen portraits but only to describe what we look for in a candidate achieving the standard and for a candidate who is not achieving the standard – we ignore the right hand column.

Work in groups of 3 or 4. For CPAC 12, write pen portraits to assist in assessing CPAC 2a, 3a & 4a. Give yourselves about 1 minute, no more, to write down what you would look for in a successful student doing 2a. Then discuss what you would agree on. Then repeat for a student falling below the standard for 2a in CP12. Again give yourselves one minute to jot down what you expect and then spend a minute or so reaching an agreement. You have now completed your first pen portrait – for CPAC 2a for CP12.

When you have done all three for CP12 move on to CP9 and write pen portraits for CPAC 1a, 2c and 4b.

CPAC 2: Applies investigative approaches and methods when using instruments and equipment		
Not achieved	**Achieved**	**Exceeds standard**
Context Physics (Year 13): Potential divider investigation **Observed** Students working in pair are unable to get their circuit to operate. The teacher leaves them for fifteen to twenty minutes to try and overcome their difficulties before stepping in to guide them to assembling a correctly functioning circuit.	**Context** Physics (Year 13): Potential divider investigation **Observed** Students working in pair are unable to get their circuit to operate. The students work though their circuit and after fifteen to twenty minutes overcome their difficulties and are able to collect data as required. (Achieves the use of instruments and equipment although not investigative 2a, b)	**Context** Physics (Year 13): Potential divider investigation **Observed** Students working in pair set up their apparatus with no issues, each participating and communicating with each other. They collect data as required and have completed the task set within twenty minutes. The teacher then asks them to determine the best value for the fixed resistor in their circuit to optimise the range of potential difference output. (Achieves the use of equipment and investigative nature 2a, b, c)

Activity 4 – Drawing up a Scheme of Practical Work for your centre

Purpose:

- To consider the options for assessment of practical skills across the whole course
- To consider the options to encourage students towards a practical mastery
- To produce a Scheme of Practical Work that can be used in your centre

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Task

You will need the sheet printed on green – the Practical Topics in the Specification. You will also need the blue sheets you used for Activity 2 this morning in looking at which CPs might be used with each Core Practical. You might also want the List of Practical Activities and the CPAC sheet, both on blue.

Using the green sheet as a guide work through the core practicals and for each practical:-

Tick off on the 5c list in your delegate booklet each Apparatus or Technique as you come to it. Remember you might be able to change you method if 5c demands are not being met overall.

On your notes sheet for Activity 2, on blue, circle the CPAC statements you will actually use and make a tick in the right hand margin of the CPAC sheet against that CPAC statement. You can keep track of how many times each statement is assessed.

Towards the end you can look at the non-core practical activities from the List of Practical Activities and you might decide that you wish to do more than 16 practical activities to give your students more opportunities to develop competence. Include these on your Scheme of Practical Work.

You should end up with circles on the CPAC column, at least 3 per Core Practical, ticks on your CPAC sheet, underlines on your 5c sheet (in booklet) and a scheme of work to be proud of.

PERSONAL LEARNING

Things to do:

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Things to avoid

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Your ideas:

THIS SHEET IS LEFT BLANK INTENTIONALLY