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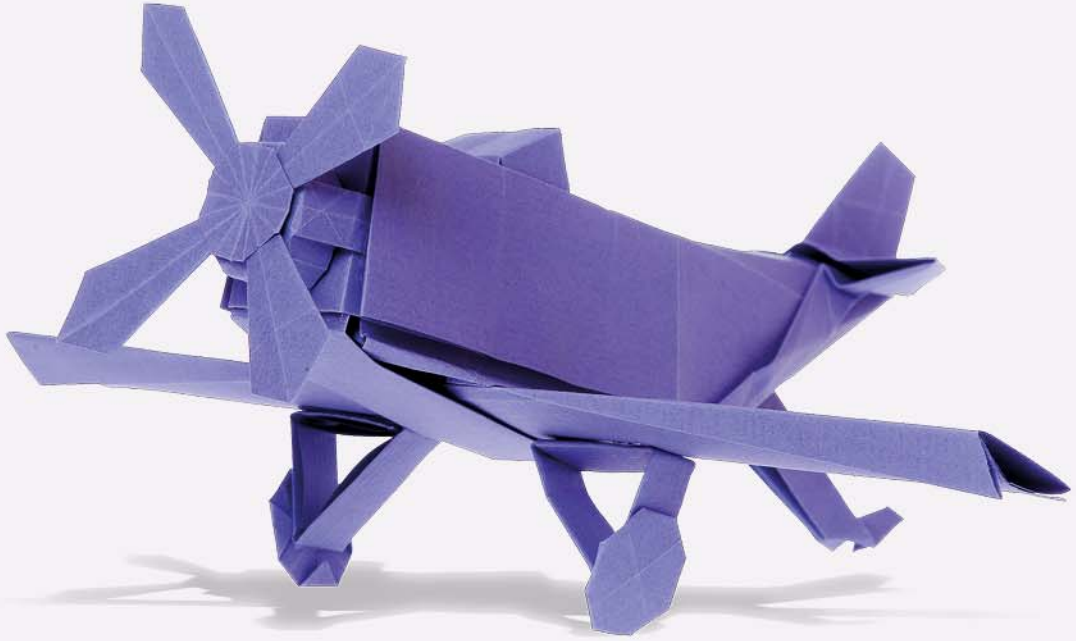
GCE A LEVEL PHYSICS

MOCK MARKING



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Agenda

- 9.30-10.00 Welcome, registration and coffee
- 10.00-11.20 Session 1: A level papers, command words and practical skills
- 11.20-11.40 Break
- 11.40-12.30 Session 2: How mark schemes are put together
- 12.30-13.30 Lunch
- 13.30-15.15 Session 3: Applying the mark scheme to student answers
- 15.15-15.30 Event evaluation and plenary

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Session 1: A level papers and command words

We will look at

- The structure of the AS and A level examination papers
- The assessment objectives
- The command words used.

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Structure of the AS papers

- Paper 1 Core Physics 1
  - 1 hour 30 minutes, 80 marks
  - 50% of the qualification
  - MC questions and section A - Mechanics and Electric Circuits
  - Section B - Synoptic questions from any part of the AS specification
  - Includes questions assessing practical skills

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Structure of the AS papers

- Paper 2 Core Physics 2
  - 1 hour 30 minutes, 80 marks
  - 50% of the qualification
  - MC questions and section A – Materials and Waves and Particle Nature of Light
  - Section B - Synoptic questions from any part of the AS specification
  - Includes questions assessing practical skills

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Structure of the A level papers

- Paper 1 Advanced Physics I
  - 1 hour 45 minutes, 90 marks
  - 30% of the qualification
  - Mechanics, electrical circuits, further mechanics, electric and magnetic fields, nuclear and particle physics
- Paper 2 Advanced Physics II
  - 1 hour 45 minutes, 90 marks
  - 30% of the qualification
  - Materials, waves and nature of light, thermodynamics, space, nuclear radiation, gravitational fields and oscillations

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Structure of the A level papers

- Paper 3 General and Practical Principles in Physics
  - 2 hour 30 minutes, 120 marks
  - 40% of the qualification
  - Synoptic and indirect assessment of practical skills

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Assessment Objectives

Students must	
AO1	Demonstrates knowledge and understanding of scientific ideas, processes, techniques and procedures.
AO2	Apply knowledge and understanding of scientific ideas, processes, techniques and procedures • In a theoretical context • In a practical context • When handling qualitative data • When handling quantitative data
AO3	Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to: • Make judgements and reach conclusions • Develop and refine practical design and procedures

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Command words

The command words are common to both the AS and the A level specification. Any of the questions set on an AS paper could have appeared on an A level paper.

The command words are in Appendix 7 (page 93 & 94) of the A level specification.

State, plot, determine, explain show are examples that are straightforward.

Command words for the AO3 assessment

Command words

Activity:

Look at the AS papers from June 2016.

Identify the AO3 questions.

8PH0 AO3 questions

Paper 1
Q11c State and justify
Q12c Explain (..) whether this circuit would work…
Q14b By evaluating
Q15c …deduce which fluid the student used

Paper 2
Q9b Deduce whether shrilk…
Q12c Determine whether the guitar string….
Q14c Deduce which lens should be used ….
Q15c Discuss whether the photocell…….

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Indirect Assessment of Practical Skills

- Recall of core practicals
- Experimental techniques and measuring instruments
- Recognising $y = mx + c$ and graph plotting
- Criticise results
- Errors
- Conclusions
- Devising experiments

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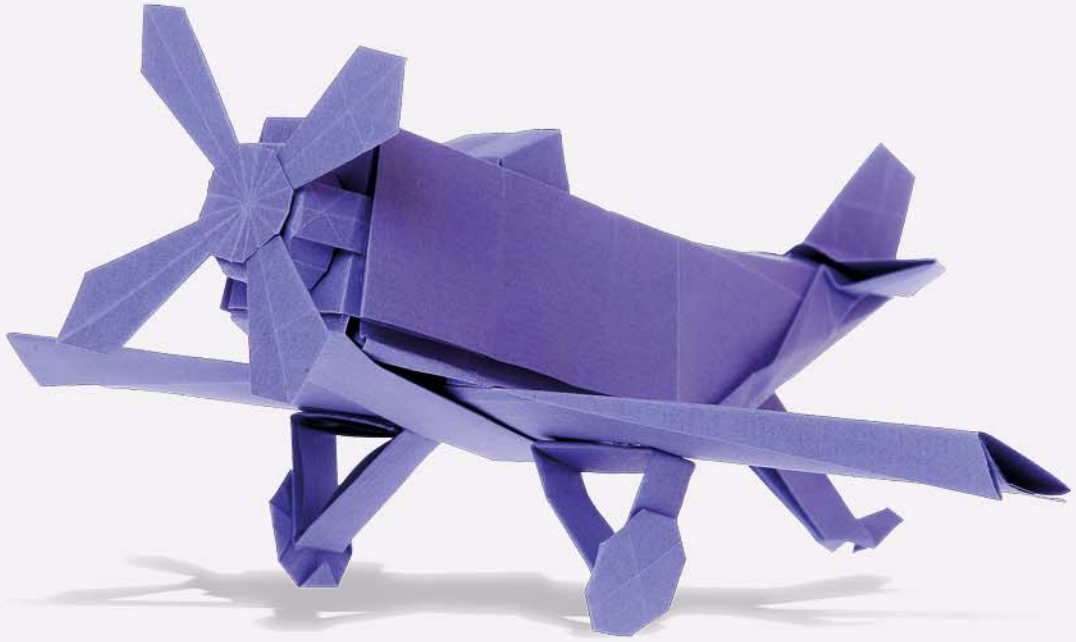
BREAK



Session 2: How mark schemes are put together

Paper production

- PE writes a paper and markscheme
- Revision
- PE writes version 2
- QPEC
- Scrutiny
- Final check

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Next steps...

Then the candidates sit the exam

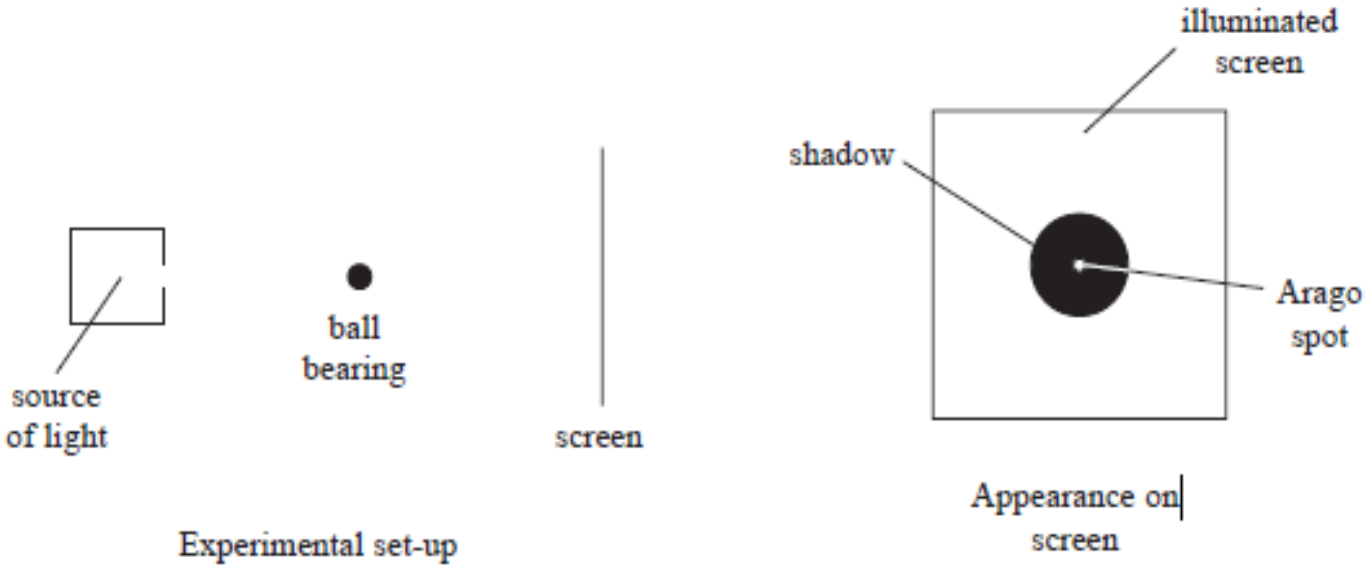
There are four possible outcomes:

- MS for a question works well
- Candidates show different methods
- Candidates ‘read’ a question differently
- Hardly any candidates score the marks.

8PH0/02 Q11

11 The diagram shows a coherent beam of light incident on a metal ball bearing.

A dark shadow is seen on a screen behind the ball bearing. There is a small spot of light in the centre of the shadow. This spot of light is known as the Arago spot.



(b) Explain why a spot of light is produced at the centre of the shadow.

(3)

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Original markscheme

- Path lengths to centre of shadow from rim of ball equal
- Will arrive in phase
- Constructive interference/maximum

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Final markscheme

An explanation that makes reference to:

- Path lengths (to centre of shadow from edge of ball) are equal **OR** path difference (at spot) is zero
- Will arrive in phase **OR** phase difference is zero
- (bright spot is position of) constructive interference/superposition

6 mark (linkage) questions

Number of indicative content points	Number of marks awarded for indicative content
6	4
4 - 5	3
3 - 2	2
1	1
0	0

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Linkage marks

Answer shows a coherent and logical structure with linkage and fully sustained lines of reasoning demonstrated throughout. **2 marks**

Answer is partially structured with some linkages and lines of reasoning. **1 mark**

Answer has no linkage between points and is unstructured. **0 mark**

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Possible answers to EM induction question about a magnet falling through tubes of different materials

A falling magnet means there is a change of magnetic flux linkage in the tube, which for copper induces an e.m.f which causes a current to flow.

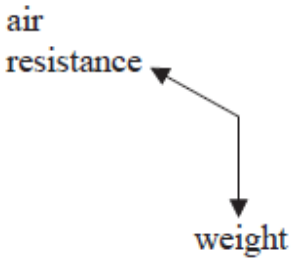
A current flows in the copper tube due to an e.m.f. which is induced because the tube has a changing flux linkage due to the falling magnet.

Writing a mark scheme

*(c) In competitions, the ski jumper aims to achieve a maximum value for *d*. He achieves this by the position he adopts in the air and using skis manufactured with low density materials.

http://newsimg.bbc.co.uk/media/images/45337000/jpg/_45337660_jump2_ap466.jpg

The free-body force diagram shows the forces acting on the ski jumper in the air.



Explain how the position of the ski jumper in the air and the materials used for the skis can help to increase his horizontal displacement.

(6)

Final Markscheme

Indicative content

- The position shown increases the vertical component of the air resistance
- Low density materials give a lower weight
- The resultant downward force/acceleration is reduced
  or reduces terminal velocity
- Increasing the time in the air
- The position of the jumper also provides a minimum horizontal component of air resistance
- Which increases the horizontal displacement by preventing large horizontal deceleration
  or keeping horizontal velocity to a maximum

Linkage marks

Answers that do not refer to horizontal and/or vertical components of air resistance will not gain credit.

One linkage mark can be made for an explanation of either vertical or horizontal motion.

Two linkage marks can only be awarded for an explanation that refers to both horizontal and vertical motion.

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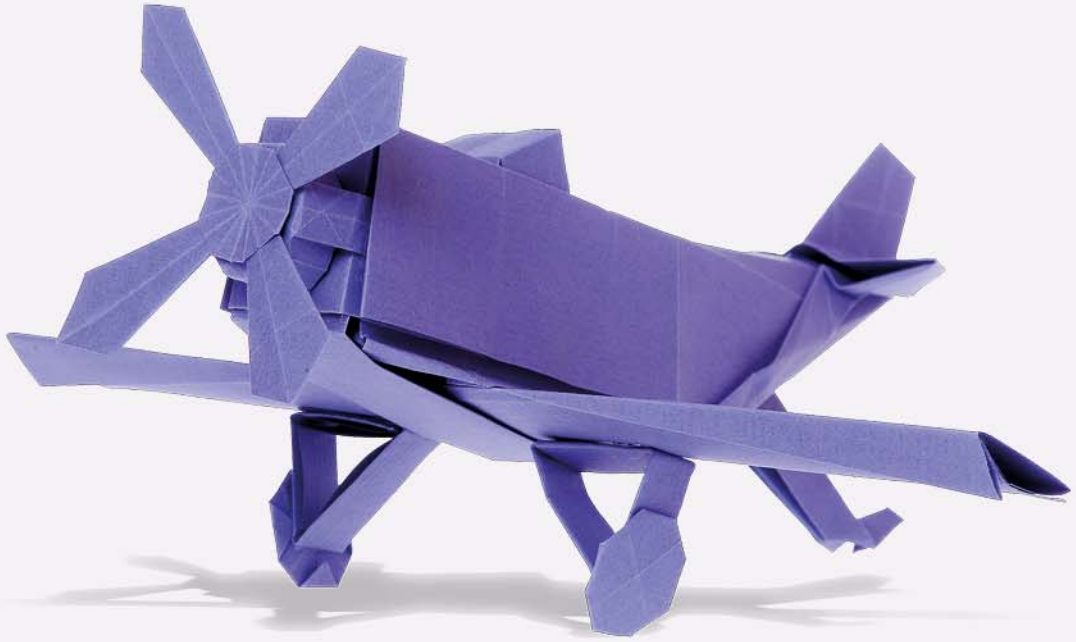
BREAK



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Session 3: Applying MS to candidates' work

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Event evaluation and Plenary