

## **MARK SCHEME for the May/June 2013 series**

### **5054 PHYSICS**

**5054/42**

Paper 4 (Alternative to Practical), maximum raw mark 30

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2013	5054	42

- 1 (a) accurate horizontal line from object to centre of lens  
and labelled  $u$  or 15 cm B1 [1]
- (b) (i) move screen (along ruler) B1 [1]  
(ii) raise object B1 [1]
- (c) (i) 45.1 cm cao unit required B1 [1]  
(ii) 30.1 cm ecf (c)(i) – 15.0 B1 [1]
- (d) (i) 15.0 and (c)(ii) inserted into top line of table B1 [1]  
(ii) axes: correct way round, labelled quantity and unit B1  
scales: more than  $\frac{1}{2}$  grid, linear, not awkward B1  
y-axis e.g.: 2 cm  $\equiv$  5 cm x-axis e.g.: 2 cm  $\equiv$  5 cm  
points plotted accurately within  $\frac{1}{2}$  small square B1  
neat crosses or small points (in circle)  
smooth curve of best fit drawn B1 [4]
- (e) any two from:  
repeat (the measurement of  $v$ ) and average  
avoid parallax in **reading** ruler **or**  
eye line/line of sight perpendicular to scale/reading **or**  
lens or screen close to ruler **or**  
mark centre of lens on base of holder  
use of set-square described  
check for zero error on ruler  
use darkened room  
clear explanation of focussing  
e.g. move screen from left, then from right  
move through focussed image from both directions, then stop B2 [2]
- (f) 9.8 to 10.0 cm ecf graph unit required B1 [1]

[Total: 13]

Page 3	Mark Scheme	Syllabus	Paper
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2	(a) (i)	line from (5, 500) to (15, 1000)	B1	
		line to (22, 1000) <b>or</b>	B1	
		line horizontal for 7 minutes at 1000 m	B1	[3]
		line to (25, 1500)		
	(ii)	1500 m or 1.5 km cao    unit required	B1	[1]
	(b)	use of pedometer measure one pace and count paces tape measure with repeated use described use of trundle wheel	B1	[1]
	(c)	<b>find/measure</b> gradient <b>and</b> where steepest/largest gradient	B1	[1]
<b>[Total: 6]</b>				
3	(a) (i)	<b>using measuring cylinder</b> measuring cylinder stated initial reading + immerse object new reading + find difference	<b>using displacement can</b> measuring cylinder stated fill can to spout + immerse object find volume of water collected	B1 B1 B1 [3]
		(ii)	sensible suggestions e.g. repeat (measurement of volume) and average avoid parallax <b>reading</b> measuring cylinder <b>or</b> eye line/line of sight perpendicular to scale/reading view level with lower meniscus avoid splashing	B1 [1]
	(b)	mass cao <b>and</b> balance	B1	[1]
	<b>[Total: 5]</b>			

Page 4	Mark Scheme	Syllabus	Paper
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- 4 (a) (i) circuit diagram containing only solar cell, voltmeter and switch in series B1 [1]
- (ii) voltmeter terminals to wrong terminals of cell  
current in voltmeter in wrong direction  
voltmeter has polarity B1
- reverse connections to voltmeter  
reverse connections to cell  
connect red/+ve terminal of voltmeter to red/+ve terminal of cell B1 [2]
- (iii) needle drawn from centre to 0.96 V B1 [1]
- (b) (movement of) head/body reduces amount of light falling on solar cell  
**head/body** not between window (light source) and cell B1
- sensible suggestion e.g.  
position of solar cell/other light sources considered B1 [2]

**[Total: 6]**